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MICROWAVE ACOUSTICS HANDBOOK. VOLUME 3. BULK WAVE VELOCITIES.(U)

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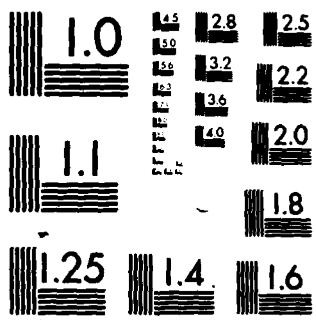
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MICROWAVE ACOUSTICS HANDBOOK
VOLUME 3, BULK WAVE VELOCITIES

A. J. Slobodnik, Jr.
R. T. Delmonico
E. D. Conway

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ROME AIR DEVELOPMENT CENTER
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REPORT DOCUMENTATION PAGE

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14

1. REPORT NUMBER: RADC-TR-80-188-Vol-3
2. GOVT ACCESSION NO.: AD-A090947
3. RECIPIENT'S CATALOG NUMBER: 9

4. TITLE (and Subtitle): 6 MICROWAVE ACOUSTICS HANDBOOK. VOLUME 3. BULK WAVE VELOCITIES.
5. TYPE OF REPORT & PERIOD COVERED: Report. for November 1971 – April 1980
6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s): 10 A. J. Slobodnik, Jr., R. T. Delmonico, E. D. Conway
8. CONTRACT OR GRANT NUMBER(s)

9. PERFORMING ORGANIZATION NAME AND ADDRESS: Deputy for Electronic Technology (RADC/EEA), Hanscom AFB, Massachusetts 01731
10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 16 2305J501 17 J5

11. CONTROLLING OFFICE NAME AND ADDRESS: Deputy for Electronic Technology (RADC/EEA), Hanscom AFB, Massachusetts 01731
12. REPORT DATE: 11 May 1980
13. NUMBER OF PAGES: 532

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): 12 533
15. SECURITY CLASS. (of this report)
15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

An explanation of related volumes is contained in the preface of this document.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Acoustic bulk wave velocities
Handbook for bulk waves
Volume wave velocities
Wave propagation
Coupling to bulk waves
Bulk waves power flow angles
Piezoelectric crystals
Acoustic delay lines

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Information useful for the design of acoustic delay lines, resonators, and other miniature, low cost, reliable devices for use in communications and electronic sensing is given in this report.

Computations of bulk acoustic wave velocities, power flow angles, and coupling to electric fields are plotted for various orientations of the following single crystalline materials: $Ba_2NaNb_5O_{15}$, $Bi_{12}GeO_{20}$, CdS, Diamond, $Eu_3Fe_5O_{15}$, Gadolinium Gallium Garnet, GaAs, Germanium, InSb, InAs,

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Lead Molybdate, PbS, $LiNbO_3$, $LiTaO_3$, MgO, Quartz, Rutile, Sapphire, Silicon, Spinel, TeO_2, YAG, YGaG, YIG, and ZnO. Particular cuts of interest, including cases for common metals, are then chosen for more detailed numerical calculations of mechanical and electrical parameters governing acoustic wave propagation in these media. A list of material constants is also included.

Preface

The increasing use of acoustic devices in military systems has prompted the generation of this Microwave Acoustics Handbook series. Other volumes, either published or in preparation, are: Volume 1A, Surface Wave Velocities; Volume 2, Surface Wave Velocities—Numerical Data; and Volume 4, Bulk Wave Velocities—Numerical Data.

The reader is urged to become familiar with the text of this handbook prior to utilization of the curves or printout in order that the notation be fully understood. The authors would, of course, appreciate having any errors or omissions brought to their attention.

The authors wish to acknowledge the support of E. Cronin, J. Cooney and R.G. Gosselin in the compilation of this report. The computer programming assistance provided by R.T. Delmonico and E.D. Conway of ACSI and J.V. O'Brien formerly of Dabcovich and Company was obtained under Air Force contract.

A

Contents

Illustrations

Tables

Microwave Acoustics Handbook
Volume 3. Bulk Wave Velocities

1. INTRODUCTION

The proper design of acoustic bulk wave delay lines, resonators, and other signal processing devices requires detailed knowledge of bulk wave velocities, pure mode axes, and coupling to external electric fields.

Since anisotropic crystals are necessary for low acoustic loss[1,2] at high frequencies, each different cut of every crystal is a special case requiring computer analysis for an exact solution. The addition of piezoelectricity, which is generally necessary to couple from electromagnetic to acoustic energy, adds further complexity to the problem. Nonpiezoelectric substrates are, of course, widely used in conjunction with evaporated thin film piezoelectric transducers.

To eliminate needless duplication among different design groups, the present volume provides this data for various orientations of piezoelectric and nonpiezoelectric crystalline materials. This task is accomplished by using the theory and computer programs previously developed by Slobodnik and O'Brien.[3] In

(Received for publication 28 May 1980)

1. Elbaum, C. (1969) Ultrasonic attenuation in crystalline solids—intrinsic and extrinsic mechanisms, Ultrasonics: pp 113-116.
2. Oliver, D.W., and Slack, G.A. (1966) Ultrasonic attenuation in insulators at room temperature, J. Appl. Phys. 37:1542-1548.
3. Slobodnik, A.J., Jr., and O'Brien, J.V. (1971) Complete Theory of Acoustic Bulk Wave Propagation in Anisotropic Piezoelectric Media, TR-71-0601, AD739162, National Technical Information Services, Springfield, Virginia 22151.

addition to the information described above, which is presented in graphical form over a wide range of orientations, particular cuts of interest are selected for more detailed numerical calculations. Also included are computations for common metals.

The next section outlines the complete theory of acoustic bulk wave propagation in anisotropic piezoelectric media, Section 3 provides bulk wave velocity and power flow angle curves, while the detailed numerical data mentioned above is given in Section 4. Finally, the material constants used in these studies are provided in Section 5.

2. THEORY OF ACOUSTIC BULK WAVE PROPAGATION

2.1 Introduction

The purpose of this section is to provide a complete theoretical solution of the problem of acoustic bulk wave[4-6] propagation in arbitrary, anisotropic piezoelectric media. This is accomplished by solving the continuum equations of motion together with Maxwell's equations under the quasi-static assumption, the strain-mechanical displacement relations, and the piezoelectric constitutive relations. These are all, of course, in tensor form.[7] Since one-dimensional propagation is assumed, several simplifications will be possible and boundary conditions are not present. The complete solutions obtained here will allow generation of the curves and numerical data of the following sections.

The general approach followed here very closely parallels the surface wave work of Campbell and Jones[8] as described in their excellent paper. A general solution is obtained for an assumed one-dimensional propagation direction along the 1 axis of a standard rectangular coordinate system. Arbitrary crystalline orientations are handled by merely transforming all applicable material constants through specified Euler angles as indicated[9] in Figure 1.

The following section begins by listing the general equations and describing the Euler transformation technique. Section 2.3 outlines the method of velocity determination, while Section 2.4 is concerned with calculations of mechanical and electrical field quantities.

(Due to the large number of references cited above, they will not be listed here. See References, page 527.)

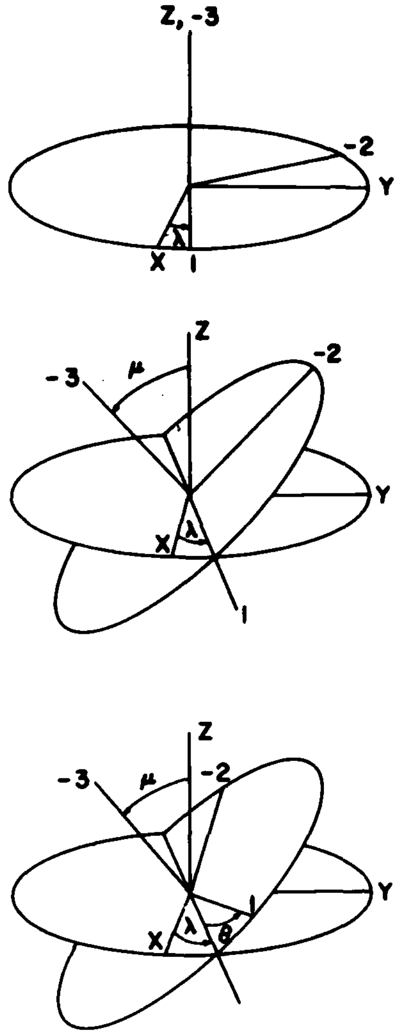


Figure 1. Coordinate System Used for Acoustic Bulk Wave Propagation. The phase velocity vector lies along the 1 axis. The crystalline axes are given in X, Y, and Z while the Euler angles are λ, μ and θ. (After H. Goldstein in Classical Mechanics)

2.2 General Equations

The set of linear equations describing acoustic wave propagation in an arbitrary, anisotropic piezoelectric medium is, in standard tensor notation, as follows[7]

$$\frac{\partial T_{ij}}{\partial x_i} = \rho \frac{\partial^2 u_j}{\partial t^2} \qquad \text{equations of motion} \tag{1}$$

$$S_{k\ell} = \frac{1}{2}\left(\frac{\partial u_k}{\partial x_\ell} + \frac{\partial u_\ell}{\partial x_k}\right) \qquad \text{linear, strain-mechanical displacement relations} \tag{2}$$

$$\left.\begin{aligned} \frac{\partial D_i}{\partial x_i} &= 0 \\ E_i &= -\frac{\partial \phi}{\partial x_i} \end{aligned}\right\} \qquad \text{derived from Maxwell's equations under the quasi-static assumption} \tag{3}$$

$$T_{ij} = c^{E'}_{ijk\ell} S_{k\ell} - e'_{nij} E_n$$

linear piezoelectric constitutive relations

$$D_m = e'_{mk\ell} S_{k\ell} + \epsilon^{S'}_{mn} E_n \qquad (4)$$

where T is the stress, ρ the mass density, u the mechanical displacement, S the strain, D the electric displacement, E the electric field, and ϕ the electric potential. The primed quantities refer to a rotated coordinate system in which the elastic constants ($c'_{ijk\ell}$), the piezoelectric constants (e'_{ijk}), and the dielectric constants (ϵ'_{ij}) are given in terms of the Euler transformation matrix V_{ij} and the unrotated quantities as follows:

$$c'_{ijk\ell} = V_{ir} V_{js} V_{kt} V_{\ell n} c_{rstn} , \qquad (5)$$

$$e'_{ijk} = V_{ir} V_{js} V_{kt} e_{rst} , \qquad (6)$$

$$\epsilon'_{ij} = V_{ir} V_{js} \epsilon_{rs} . \qquad (7)$$

Note that the summation convention (over 1, 2, 3) for repeated indices is employed. For completeness we also list the Euler transformation matrix in terms of the arbitrary Euler angles λ, μ and θ:

$$V = \begin{bmatrix} \cos\lambda \cos\theta - \sin\lambda \cos\mu \sin\theta & \sin\lambda \cos\theta + \cos\lambda \cos\mu \sin\theta & \sin\mu \sin\theta \\ -\cos\lambda \sin\theta - \sin\lambda \cos\mu \cos\theta & -\sin\lambda \sin\theta + \cos\lambda \cos\mu \cos\theta & \sin\mu \cos\theta \\ \sin\lambda \sin\mu & -\cos\lambda \sin\mu & \cos\mu \end{bmatrix} \qquad (8)$$

Note that for $\lambda = \mu = \theta = 0$, the coordinate system x_1, x_2 and x_3 lies along the crystalline axes, X, Y and Z as illustrated in Figure 1.

By substitution, Eqs. (1) through (4) can be reduced to

$$c'_{ijk\ell} u_{k,\ell i} + e'_{kij} \phi_{,ki} = \rho \ddot{u}_j \qquad j = 1, 2, 3 \qquad (9)$$

$$e'_{ik\ell} u_{k,\ell i} - \epsilon'_{ik} \phi_{,ki} = 0 . \qquad (10)$$

The dot notation refers to differentiation with respect to time while an index preceded by a comma denotes differentiation with respect to a space coordinate.

2.3 Velocity Determination

Solutions of Eqs. (9) and (10) are assumed to be of the standard complex travelling-wave form in which v is the wave velocity and ω the steady-state angular frequency:

$$u_i = \beta_i e^{j\omega (t - x_1/v)} \qquad i = 1, 2, 3 \tag{11}$$

$$\phi = \beta_4 e^{j\omega (t - x_1/v)} \; . \tag{12}$$

Substituting these assumed solutions back into Eqs. (9) and (10) results in a 4 X 4 matrix times the vector matrix of the unknown β's (the one-dimensional assumption implying $\partial / \partial x_2 = \partial / \partial x_3 = 0$ has been made):

$$\begin{bmatrix} (-c'_{11} + \rho v^2) & -c'_{16} & -c'_{15} & -e'_{11} \\ -c'_{16} & (-c'_{66} + \rho v^2) & -c'_{56} & -e'_{16} \\ -c'_{15} & -c'_{56} & (-c'_{55} + \rho v^2) & -e'_{15} \\ -e'_{11} & -e'_{16} & -e'_{15} & \epsilon'_{11} \end{bmatrix} \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{bmatrix} = 0 \tag{13}$$

Engineering notation[10] has been introduced to simplify subscript convention.

For a non-trivial solution of the β's to exist, the determinant of the 4 X 4 matrix must be zero:

10. Slobodnik, A. J., Jr. (1967) Microwave Rectification Using Quartz, TR-67-0143, AD 655776, National Technical Information Services, Springfield, Virginia 22151.

$$\begin{vmatrix} (-c'_{11}+\rho v^2) & -c'_{16} & -c'_{15} & -e'_{11} \\ -c'_{16} & (-c'_{66}+\rho v^2) & -c'_{56} & -e'_{16} \\ -c'_{15} & -c'_{56} & (-c'_{55}+\rho v^2) & -e'_{15} \\ -e'_{11} & -e'_{16} & -e'_{15} & \epsilon'_{11} \end{vmatrix} = 0 \tag{14}$$

Evaluation of this relation results in a sixth-order polynomial in v of the form

$$v^6 + pv^4 + qv^2 + r = 0 \tag{15}$$

where

$$p = \frac{-(c'_{11} + c'_{55} + c'_{66})}{\rho} - \frac{(e'^2_{11} + e'^2_{15} + e'^2_{16})}{\rho\epsilon'_{11}} \tag{16}$$

$$q = \frac{c'_{11}c'_{55} + c'_{11}c'_{66} - c'^2_{15} - c'^2_{16} + c'_{55}c'_{66} - c'^2_{56}}{\rho^2}$$

$$+ \frac{(c'_{11} + c'_{55})e'^2_{16} + (c'_{11} + c'_{66})e'^2_{15} + (c'_{55} + c'_{66})e'^2_{11}}{\rho^2\epsilon'_{11}}$$

$$- 2\,\frac{c'_{56}e'_{15}e'_{16} + c'_{16}e'_{11}e'_{16} + c'_{15}e'_{11}e'_{15}}{\rho^2\epsilon'_{11}} \tag{17}$$

$$r = \frac{-c'_{11}c'_{55}c'_{66} + c'_{11}c'^{2}_{56} + c'^{2}_{16}c'_{55} - 2c'_{15}c'_{16}c'_{56} + c'^{2}_{15}c'_{66}}{\rho^3}$$

$$+ 2\,\frac{c'_{11}c'_{56}e'_{15}e'_{16} - c'_{16}c'_{56}e'_{15}e'_{11} - c'_{15}c'_{16}e'_{15}e'_{16} + c'_{16}c'_{55}e'_{11}e'_{16}}{\rho^3\epsilon'_{11}}$$

$$+ 2\,\frac{c'_{15}c'_{66}e'_{11}e'_{15} - c'_{15}c'_{56}e'_{11}e'_{16}}{\rho^3\epsilon'_{11}}$$

$$+ \frac{(c'^{2}_{13} - c'_{11}c'_{55})e'^{2}_{16} + (c'^{2}_{16} - c'_{11}c'_{66})e'^{2}_{15} + (c'^{2}_{56} - c'_{55}c'_{66})e'^{2}_{11}}{\rho^3\epsilon'_{11}} \tag{18}$$

This sixth-order polynomial is then solved for the three (in general) positive and real velocities $v^{(j)}$ corresponding to the physical solutions. This is accomplished, of course, by means of a computer program.[3] Several errors are present in the program listing of Reference 3; notably line 434 should have a minus rather than a plus sign and the phases for u_i and ϕ should be either 0 or 180 degrees.

2.4 Mechanical and Electrical Field Quantities

In order to calculate the mechanical displacements and electric potential associated with each of the three velocities determined in Section 2.3, it is necessary to return to Eq. (13). For each particular velocity, a set of β's can be found ($\beta_i^{(j)}$, where j = 1, 2, 3) which satisfy Eq. (13). The mechanical displacements and electric potentials are then given by

$$u_i^{(j)} = \beta_i^{(j)} e^{j\omega(t - x_1/v^{(j)})} \tag{19}$$

$$\phi^{(j)} = \beta_4^{(j)} e^{j\omega(t - x_1/v^{(j)})} . \tag{20}$$

These quantities normalized to the square root of the magnitude of the power in the propagation direction are printed out in Section 4. All other mechanical and electrical field quantities of interest are obtained by using Eqs. (19) and (20) in conjunction with Eqs. (1) through (4).

Strain is given directly in terms of mechanical displacement in Eq. (2). Thus:

$$S_{11}^{(j)} = \frac{1}{2}\left(\frac{\partial u_1^{(j)}}{\partial x_1} + \frac{\partial u_1^{(j)}}{\partial x_1}\right) = -\frac{\beta_1^{(j)} j\omega}{v^{(j)}} e^{j\omega(t-x_1/v^{(j)})} \tag{21}$$

$$S_{12}^{(j)} = S_{21}^{(j)} = \frac{1}{2}\frac{\partial u_2^{(j)}}{\partial x_1} = -\frac{\beta_2^{(j)} j^{\omega}}{2v^{(j)}} e^{j\omega(t-x_1/v^{(j)})} \tag{22}$$

(Recall that we have made the one-dimensional assumption which implies $\partial/\partial x_2 = \partial/\partial x_3 = 0$)

$$S_{13}^{(j)} = S_{31}^{(j)} = \frac{1}{2}\frac{\partial u_3^{(j)}}{\partial x_1} = -\frac{\beta_3^{(j)} j\omega}{2v^{(j)}} e^{j\omega(t-x_1/v^{(j)})} \tag{23}$$

$$S_{22} = S_{33} = S_{32} = S_{23} = 0\ . \tag{24}$$

For convenience these quantities are normalized to the angular frequency:

$$\frac{S_{11}^{(j)}}{\omega} = -\frac{j\beta_1^{(j)}}{v^{(j)}} e^{j\omega(t-x_1/v^{(j)})} \tag{25}$$

$$\frac{S_{12}^{(j)}}{\omega} = \frac{S_{21}^{(j)}}{\omega} = -\frac{j\beta_2^{(j)}}{2v^{(j)}} e^{j\omega(t-x_1/v^{(j)})} \tag{26}$$

$$\frac{S_{13}^{(j)}}{\omega} = \frac{S_{31}^{(j)}}{\omega} = -\frac{j\beta_3^{(j)}}{2v^{(j)}} e^{j\omega(t-x_1/v^{(j)})}\ . \tag{27}$$

These quantities normalized to $\sqrt{|P_1|}$ are the ones printed out in Section 4. Or in terms of engineering notation.

$$\frac{S_1^{(j)}}{\omega} = -\frac{j\beta_1^{(j)}}{v^{(j)}} e^{j\omega(t-x_1/v^{(j)})} \tag{28}$$

$$\frac{S_6^{(j)}}{\omega} = -\frac{j\beta_2^{(j)}}{v^{(j)}} e^{j\omega(t-x_1/v^{(j)})} \tag{29}$$

$$\frac{S_5^{(j)}}{\omega} = -\frac{j\beta_3^{(j)}}{v^{(j)}} e^{j\omega(t-x_1/v^{(j)})} \quad . \tag{30}$$

Using Eq. (3) yields the electric field (as printed out in Section 4 after normalization to $\sqrt{|P_1|}$.

$$\frac{E_1^{(j)}}{\omega} = \frac{j\beta_4^{(j)}}{v^{(j)}} e^{j\omega(t-x_1/v^{(j)})} \tag{31}$$

$$\frac{E_2^{(j)}}{\omega} = \frac{E_3^{(j)}}{\omega} = 0 \ . \tag{32}$$

The stresses and electric displacements are obtained by using Eq. (4):

$$\frac{T_{11}^{(j)}}{\omega} = -\frac{j}{v^{(j)}} \left[c'_{11}\beta_1^{(j)} + c'_{15}\beta_3^{(j)} + c'_{16}\beta_2^{(j)} + e'_{11}\beta_4^{(j)}\right] e^{j\omega(t-x_1/v^{(j)})} \tag{33}$$

$$\frac{T_{22}^{(j)}}{\omega} = -\frac{j}{v^{(j)}} \left[c'_{21}\beta_1^{(j)} + c'_{25}\beta_3^{(j)} + c'_{26}\beta_2^{(j)} + e'_{12}\beta_4^{(j)}\right] e^{j\omega(t-x_1/v^{(j)})} \tag{34}$$

$$\frac{T_{33}^{(j)}}{\omega} = -\frac{j}{v^{(j)}} \left[c'_{31}\beta_1^{(j)} + c'_{35}\beta_3^{(j)} + c'_{36}\beta_2^{(j)} + e'_{13}\beta_4^{(j)}\right] e^{j\omega(t-x_1/v^{(j)})} \tag{35}$$

$$\frac{T_{23}^{(j)}}{\omega} = \frac{T_{32}^{(j)}}{\omega} = -\frac{j}{v^{(j)}} \left[c'_{41}\beta_1^{(j)} + c'_{45}\beta_3^{(j)} + c'_{46}\beta_2^{(j)} + e'_{14}\beta_4^{(j)}\right] e^{j\omega(t-x_1/v^{(j)})} \tag{36}$$

$$\frac{T_{31}^{(j)}}{\omega} = \frac{T_{13}^{(j)}}{\omega} = -\frac{j}{v^{(j)}} \left[c'_{51}\beta_1^{(j)} + c'_{55}\beta_3^{(j)} + c'_{56}\beta_2^{(j)} + e'_{15}\beta_4^{(j)}\right] e^{j\omega(t-x_1/v^{(j)})} \tag{37}$$

$$\frac{T_{21}^{(j)}}{\omega} = \frac{T_{12}^{(j)}}{\omega} = -\frac{j}{v^{(j)}} \left[c'_{61}\beta_1^{(j)} + c'_{65}\beta_3^{(j)} + c'_{66}\beta_2^{(j)} + e'_{16}\beta_4^{(j)}\right] e^{j\omega(t-x_1/v^{(j)})} \tag{38}$$

$$\frac{D_1^{(j)}}{\omega} = -\frac{j}{v^{(j)}} \left[e'_{11}\beta_1^{(j)} + e'_{15}\beta_3^{(j)} + e'_{16}\beta_2^{(j)} - \epsilon'_{11}\beta_4^{(j)}\right] e^{j\omega(t-x_1/v^{(j)})} \tag{39}$$

$$\frac{D_2^{(j)}}{\omega} = -\frac{j}{v^{(j)}}\left[e'_{21}\beta_1^{(j)} + e'_{25}\beta_3^{(j)} + e'_{26}\beta_2^{(j)} - \epsilon'_{21}\beta_4^{(j)}\right] e^{j\omega(t-x_1/v^{(j)})} \tag{40}$$

$$\frac{D_3^{(j)}}{\omega} = -\frac{j}{v^{(j)}}\left[e'_{31}\beta_1^{(j)} + e'_{35}\beta_3^{(j)} + e'_{36}\beta_2^{(j)} - \epsilon'_{31}\beta_4^{(j)}\right] e^{j\omega(t-x_1/v^{(j)})} \tag{41}$$

These are the quantities printed out in Section 4 after normalization to $\sqrt{|P_1|}$.

Another important quantity of interest is the total electromechanical complex power density which is defined by:

$$P_i = -\frac{1}{2} T_{ij}\dot{u}_j^* + \frac{1}{2}\phi\,\dot{D}_i^* \tag{42}$$

where the first term represents the flow of complex mechanical power at any point, and the second term represents the electric power flow. In expanded form, Eq. (42) becomes:

$$P_1 = -\frac{1}{2}\left[T_{11}\dot{u}_1^* + T_{12}\dot{u}_2^* + T_{13}\dot{u}_3^* - \phi\dot{D}_1^*\right] \tag{43}$$

$$P_2 = -\frac{1}{2}\left[T_{21}\dot{u}_1^* + T_{22}\dot{u}_2^* + T_{23}\dot{u}_3^* - \phi\dot{D}_2^*\right] \tag{44}$$

$$P_3 = -\frac{1}{2}\left[T_{31}\dot{u}_1^* + T_{32}\dot{u}_2^* + T_{33}\dot{u}_3^* - \phi\dot{D}_3^*\right] \tag{45}$$

Substituting Eqs. (19), (20), and (33) through (41) into Eqs. (43) through (45) yields explicit expressions for the complex power flow in the form printed out in Section 4.

$$\begin{aligned}\frac{P_1^{(j)}}{\omega^2} = \frac{1}{2v^{(j)}}&\Big[c'_{11}\beta_1^{(j)*} + c'_{15}\beta_3^{(j)}\beta_1^{(j)*} + c'_{16}\beta_2^{(j)}\beta_1^{(j)*} + e'_{11}\beta_4^{(j)}\beta_1^{(j)*}\\ &+ c'_{61}\beta_1^{(j)}\beta_2^{(j)*} + c'_{65}\beta_3^{(j)}\beta_2^{(j)*} + c'_{66}\beta_2^{(j)}\beta_2^{(j)*} + e'_{16}\beta_4^{(j)}\beta_2^{(j)*} + c'_{51}\beta_1^{(j)}\beta_3^{(j)*}\\ &+ c'_{55}\beta_3^{(j)}\beta_3^{(j)*} + c'_{56}\beta_2^{(j)}\beta_3^{(j)*} + e'_{15}\beta_4^{(j)}\beta_3^{(j)*}\Big]\\ &+ \frac{1}{2v^{(j)}}\Big[e'_{11}\beta_4^{(j)}\beta_1^{(j)*} + e'_{15}\beta_4^{(j)}\beta_3^{(j)*} + e'_{16}\beta_4^{(j)}\beta_2^{(j)*} - \epsilon'_{11}\beta_4^{(j)}\beta_4^{(j)*}\Big]\end{aligned} \tag{46}$$

$$
\begin{aligned}
\frac{P_2^{(j)}}{\omega^2} = \frac{1}{2v^{(j)}} \Big[& c'_{61}\beta_1^{(j)}\beta_1^{(j)*} + c'_{65}\beta_3^{(j)}\beta_1^{(j)*} + c'_{66}\beta_2^{(j)}\beta_1^{(j)*} + e'_{16}\beta_4^{(j)}\beta_1^{(j)*} \\
& + c'_{21}\beta_1^{(j)}\beta_2^{(j)*} + c'_{25}\beta_3^{(j)}\beta_2^{(j)*} + c'_{26}\beta_2^{(j)}\beta_2^{(j)*} + e'_{12}\beta_4^{(j)}\beta_2^{(j)*} + c'_{41}\beta_1^{(j)}\beta_3^{(j)*} \\
& + c'_{45}\beta_3^{(j)}\beta_3^{(j)*} + c'_{46}\beta_2^{(j)}\beta_3^{(j)*} + e'_{14}\beta_4^{(j)}\beta_3^{(j)*} \Big] \\
& + \frac{1}{2v^{(j)}} \Big[e'_{21}\beta_4^{(j)}\beta_1^{(j)*} + e'_{25}\beta_4^{(j)}\beta_3^{(j)*} + e'_{26}\beta_4^{(j)}\beta_2^{(j)*} - \epsilon'_{21}\beta_4^{(j)}\beta_4^{(j)*} \Big]
\end{aligned}
\tag{47}
$$

$$
\begin{aligned}
\frac{P_3^{(j)}}{\omega^2} = \frac{1}{2v^{(j)}} \Big[& c'_{51}\beta_1^{(j)}\beta_1^{(j)*} + c'_{55}\beta_3^{(j)}\beta_1^{(j)*} + c'_{56}\beta_2^{(j)}\beta_1^{(j)*} + e'_{15}\beta_4^{(j)}\beta_1^{(j)*} \\
& + c'_{41}\beta_1^{(j)}\beta_2^{(j)*} + c'_{45}\beta_3^{(j)}\beta_2^{(j)*} + c'_{46}\beta_2^{(j)}\beta_2^{(j)*} + e'_{14}\beta_4^{(j)}\beta_2^{(j)*} + c'_{31}\beta_1^{(j)}\beta_3^{(j)*} \\
& + c'_{33}\beta_3^{(j)}\beta_3^{(j)*} + c'_{36}\beta_2^{(j)}\beta_3^{(j)*} + e'_{13}\beta_4^{(j)}\beta_3^{(j)*} \Big] \\
& + \frac{1}{2v^{(j)}} \Big[e'_{31}\beta_4^{(j)}\beta_1^{(j)*} + e'_{35}\beta_4^{(j)}\beta_3^{(j)*} + e'_{36}\beta_4^{(j)}\beta_2^{(j)*} - \epsilon'_{31}\beta_4^{(j)}\beta_4^{(j)*} \Big]
\end{aligned}
\tag{48}
$$

A pure mode axis will be defined as any direction for which $P_2 = P_3 = 0$. In order to quantitatively describe the deviations from a pure mode axis, it is convenient to define quantities known as the power flow angles:

$$
\phi_{12}^{(j)} \equiv \tan^{-1} \frac{\mathrm{Re}[P_2^{(j)}/\omega^2]}{\mathrm{Re}[P_1^{(j)}/\omega^2]}
\tag{49}
$$

$$
\phi_{13}^{(j)} \equiv \tan^{-1} \frac{\mathrm{Re}[P_3^{(j)}/\omega^2]}{\mathrm{Re}[P_1^{(j)}/\omega^2]}
\tag{50}
$$

where, of course, the time average power flow in a given direction is the real part of the complex power.[11,12] These quantities are printed out in Section 4.

3. BULK WAVE VELOCITY AND POWER FLOW ANGLE CURVES

Three types of data are presented in this section: Bulk wave phase velocities; power flow angles determined according to Eqs. (49) and (50); and for all piezoelectric materials, the quantity $\delta v/v$. This last parameter is the percentage change in velocity due to piezoelectric stiffening and is a direct measure of sound wave coupling to a perpendicular electric field. It is calculated by computing the velocity in the normal way, subtracting the velocity for the same mode (not always easy to identify) computed with piezoelectric constants set to zero, and finally dividing by the actual velocity.

No plots for the indicated modes are provided for the 0, 0 theta orientations of the materials listed in Table 1, since the normally plotted parameters are constant as a function of angle. Numerical data can be found in Section 4 which is therefore applicable to the entire plane.

Table 1. List of Materials and Modes Which Have Constant Properties for the Entire 0, 0 Theta Orientation

Material	Mode	Velocity (m/sec)
Diamond	First Shear	12,804.4
Eu_3FeO_{12}	First Shear	3483.4
Gadolinium Gallium Garnet	First Shear	3567.8
Germanium	First Shear	3548.8
Lead Molybdate	Second Shear	1960.0
PbS	Second Shear	1751.2
MgO	First Shear	6598.4
Rutile	Second Shear	5382.6
Silicon	Second Shear	5844.9
Spinel	First Shear	6536.5
TeO_2	Second Shear	2103.3
YAG	First Shear	5027.4
Yttrium Gallium Garnet	First Shear	4061.3
YIG	Second Shear	3844.2
ZnO	All Modes	—

11. Auld, B.A. (1973) Acoustic Fields and Waves in Solids, Wiley, New York.

12. Coquin, G.A., and Tiersten, H.F. (1967) Analysis of the excitation and detection of piezoelectric surfaces in quartz by means of surface electrodes, J. Acoust. Soc. Am. 41:921-939.

Each of the three quantities described above are presented for various crystalline orientations as continuous graphical functions of the direction of propagation in the planes of various plates as defined in Figure 2. Information necessary to understand the "rotated constant" notations can be found in the Appendix. Separate sets of curves are provided for the longitudinal, first shear and second shear waves. In all cases, except TeO_2, the longitudinal wave is considered to have the highest velocity and no differentiation is made between these and quasi-longitudinal or quasi-shear waves. To preserve continuous graphical functions in the presence of fast and slow shear mode velocity crossover, the first and second shear waves as listed in this handbook do not necessarily coincide with the fast and slow shear modes. Some shear wave labeling inconsistencies may also be found between the graphs and numerical data. For TeO_2 longitudinal, fast shear crossover exists and this material must be considered a special case.

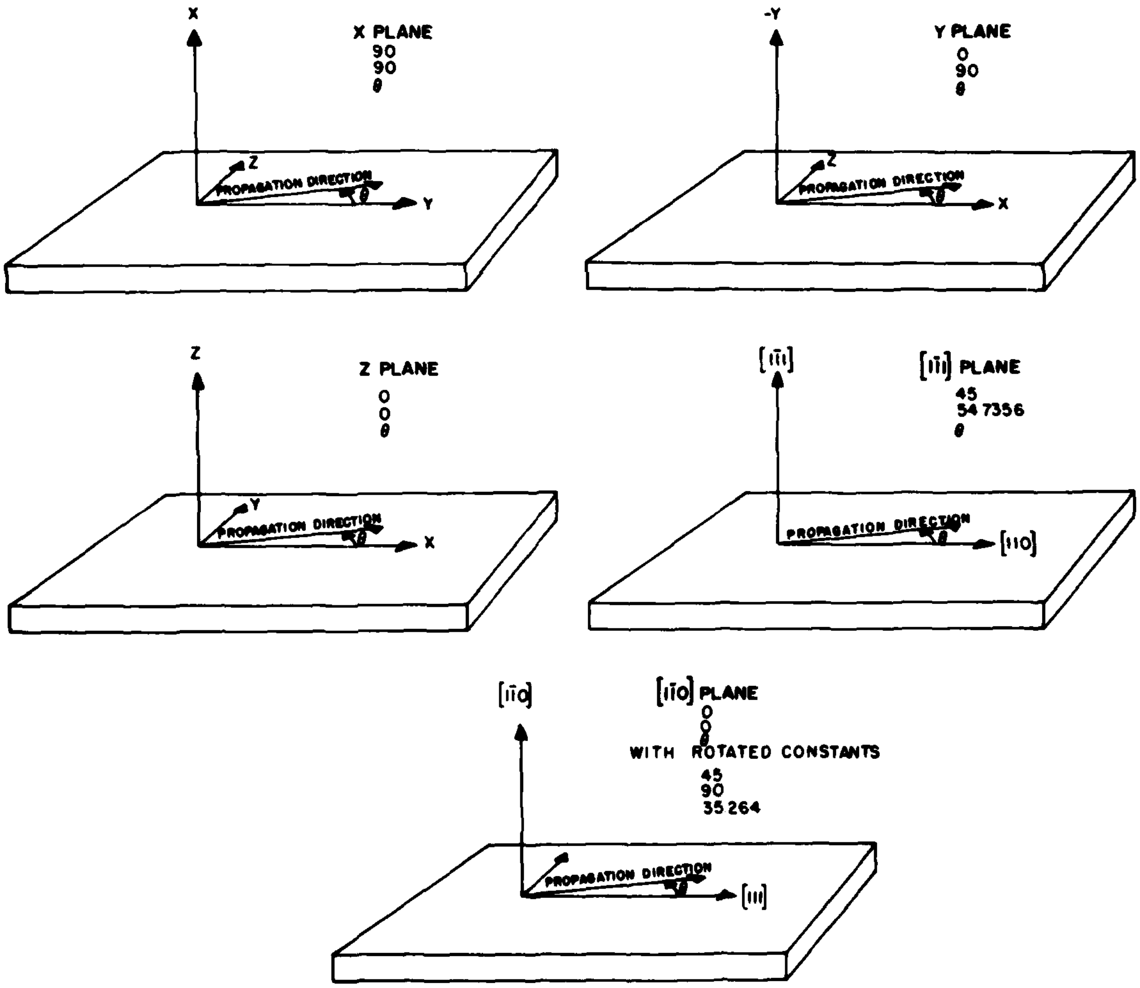
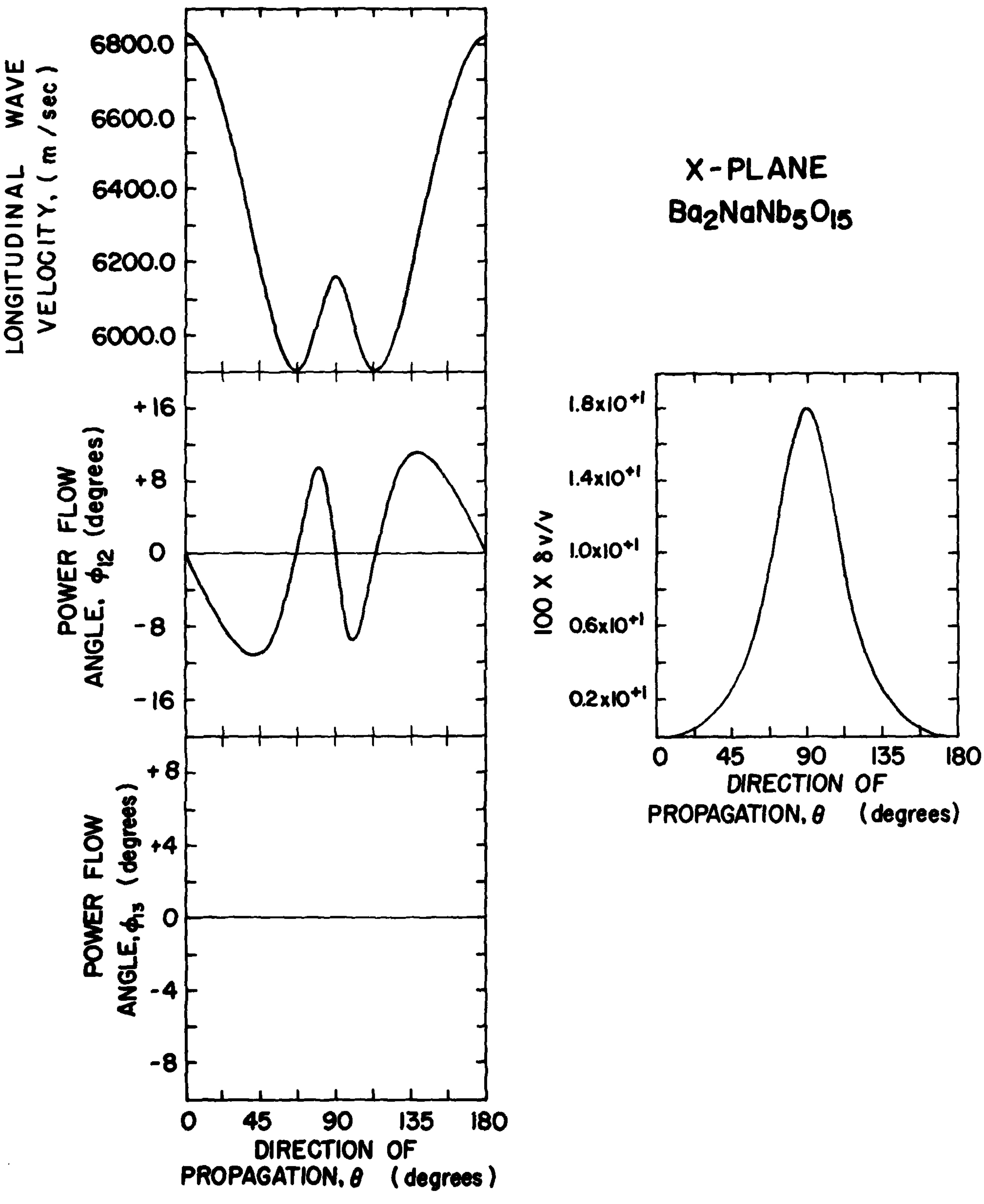
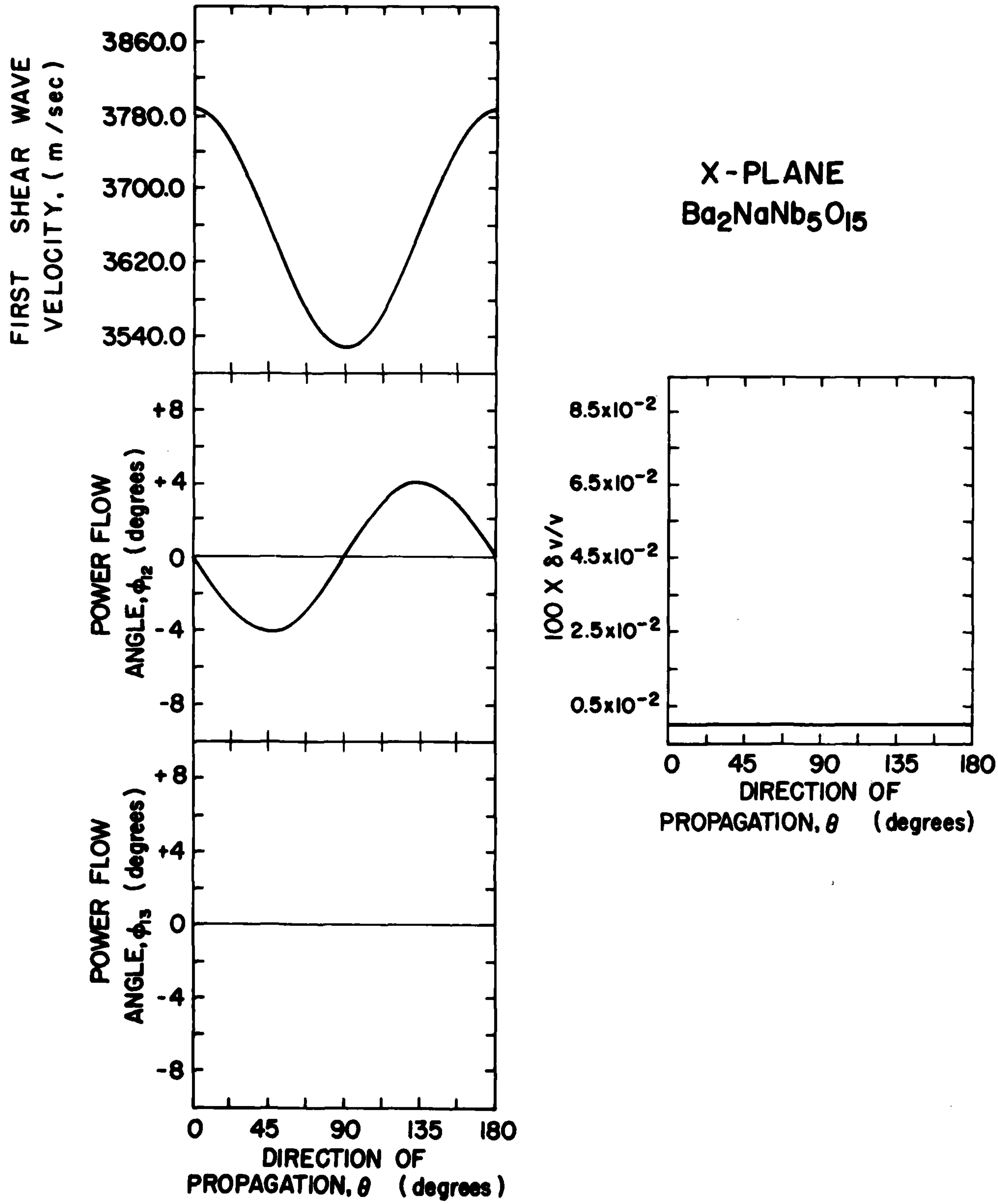
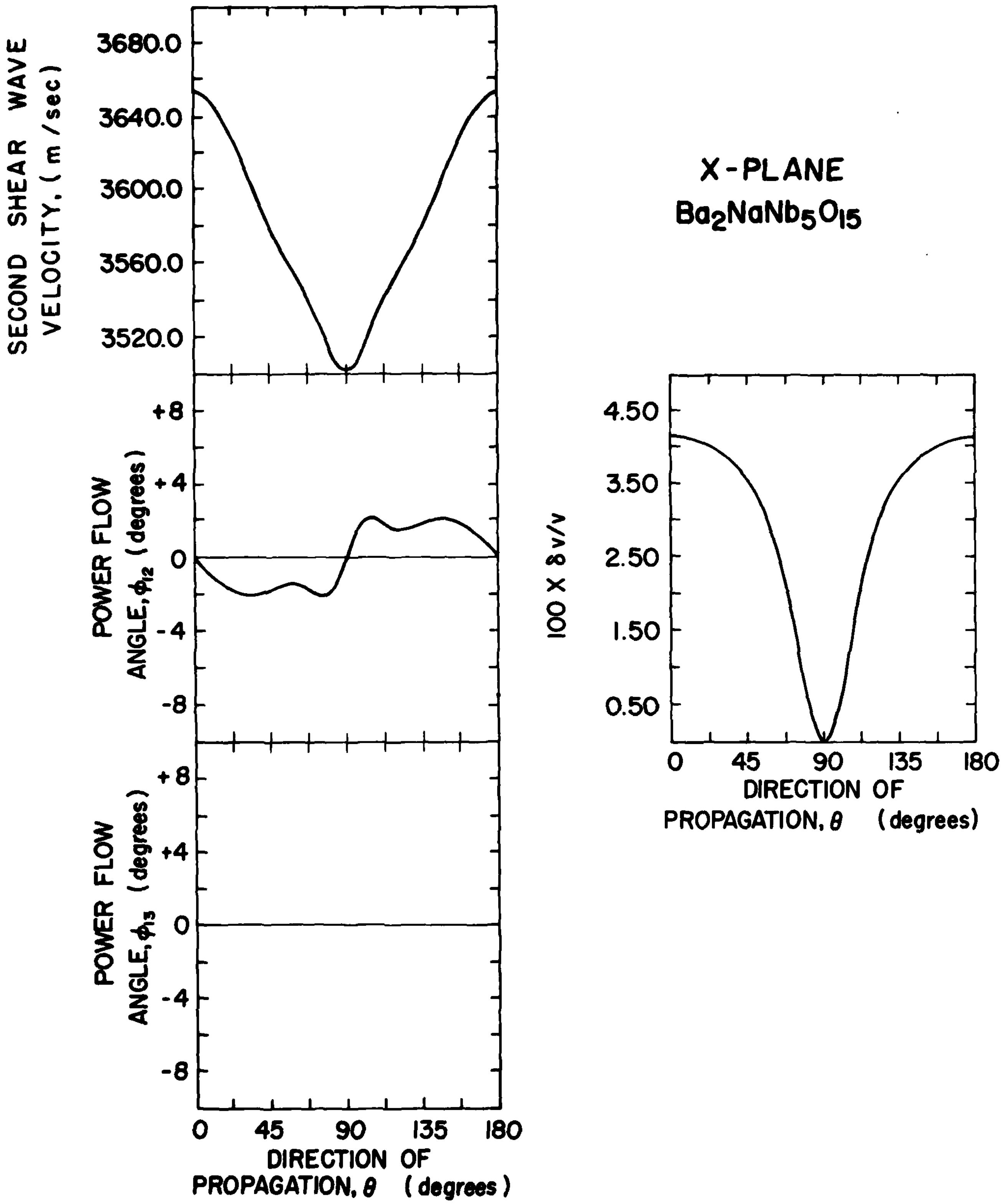


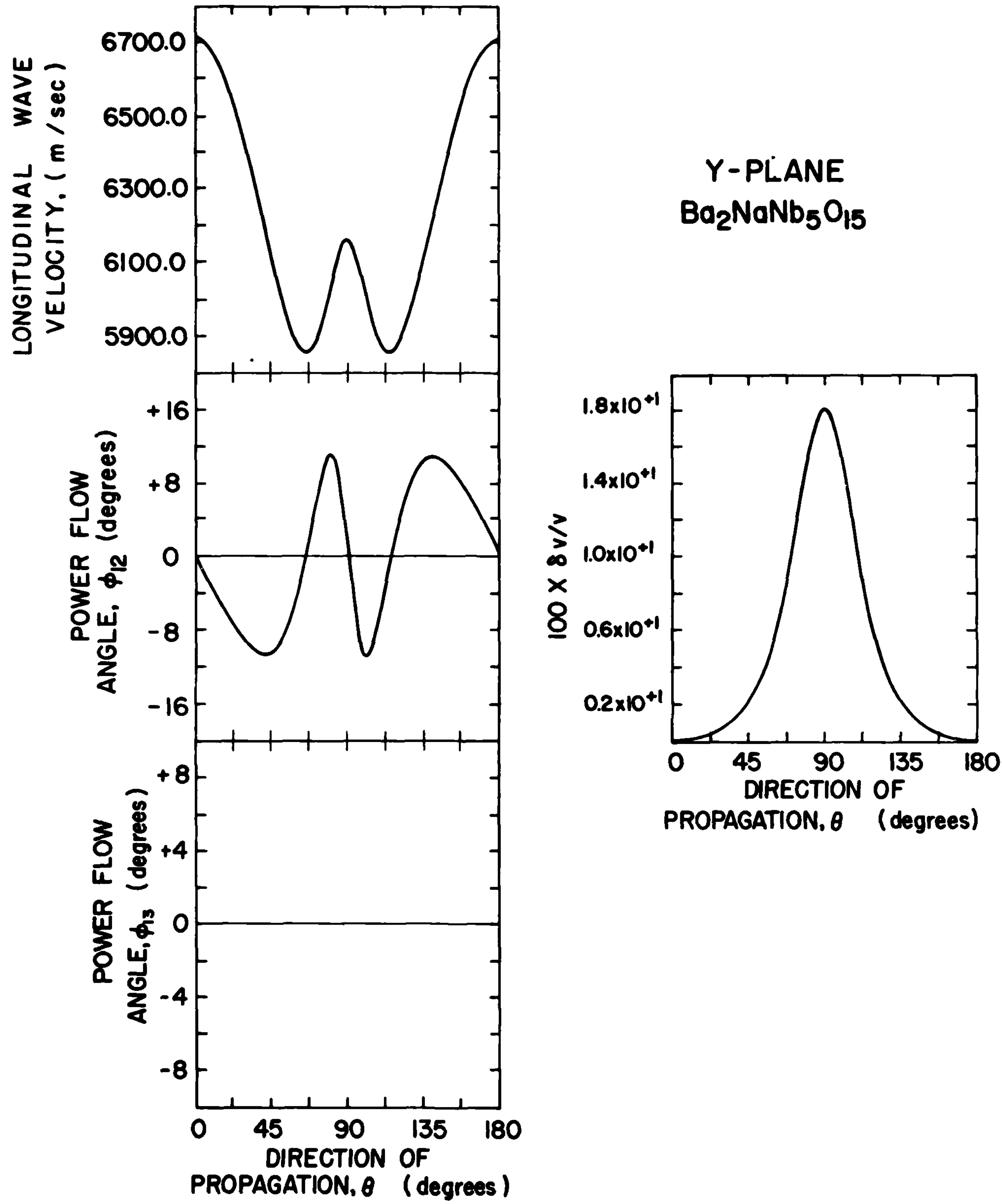
Figure 2. Euler Angle Notation For Acoustic Bulk Wave Propagation. The X plane can also be called the YZ plane, the Y plane can be referred to as the XZ plane, and the Z plane is also known as the XY plane

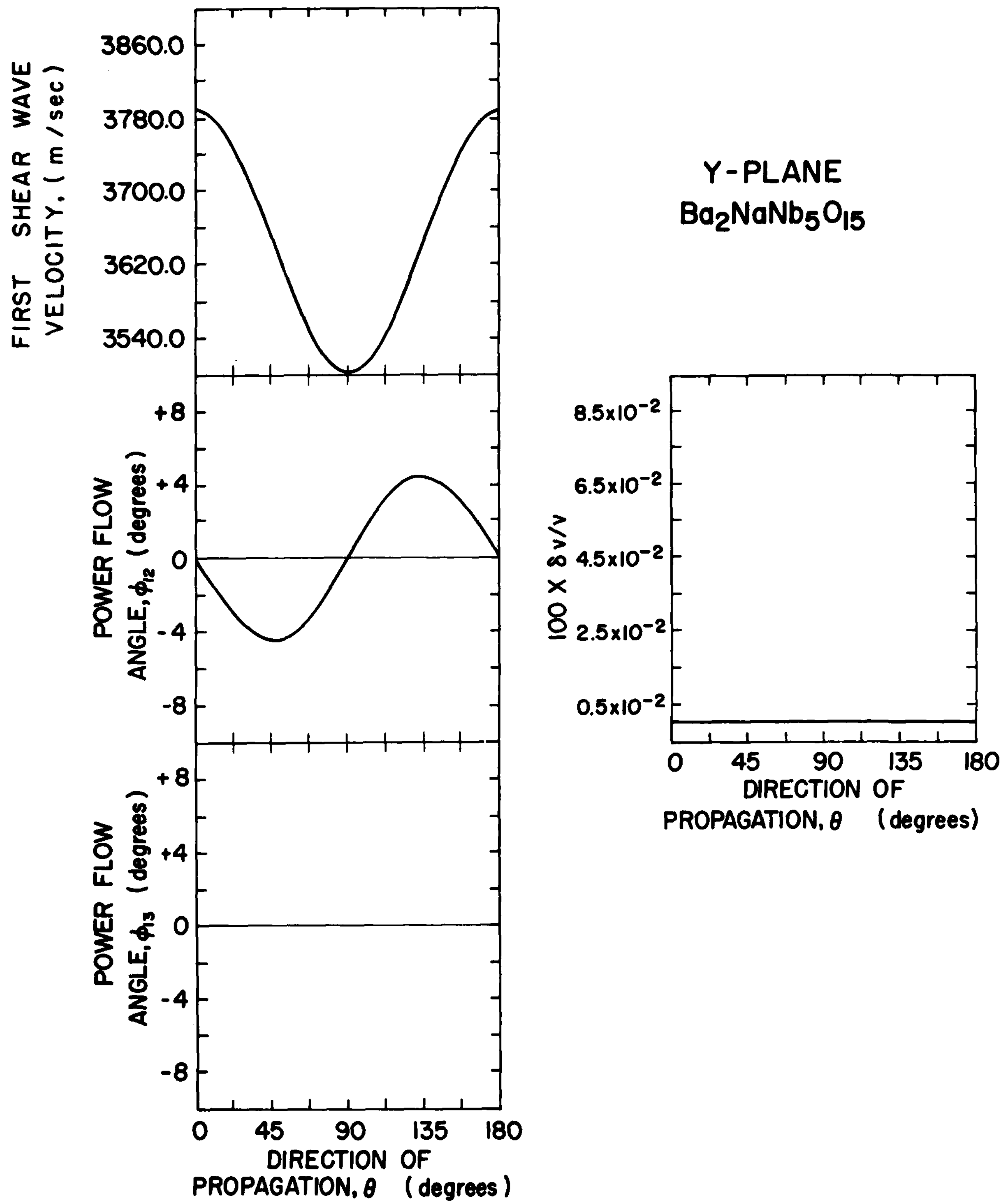


LONGITUDINAL WAVE VELOCITY, (m/sec)
6800.0
6600.0
6400.0
6200.0
6000.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
X-PLANE
$Ba_2NaNb_5O_{15}$
100 X $\delta v/v$
$1.8 \times 10^{+1}$
$1.4 \times 10^{+1}$
$1.0 \times 10^{+1}$
$0.6 \times 10^{+1}$
$0.2 \times 10^{+1}$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

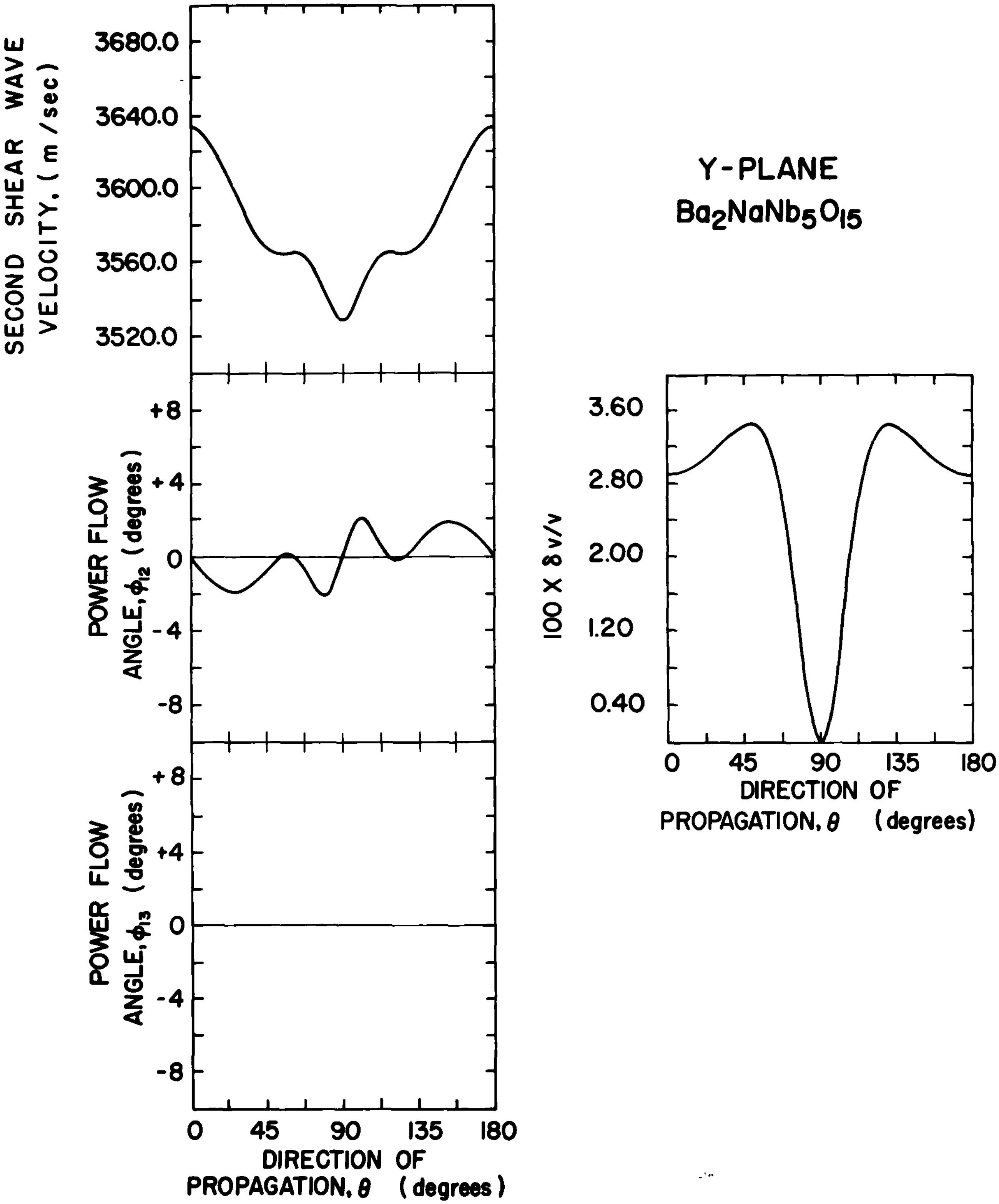

X-PLANE
$Ba_2NaNb_5O_{15}$
FIRST SHEAR WAVE VELOCITY, (m/sec)
3860.0
3780.0
3700.0
3620.0
3540.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

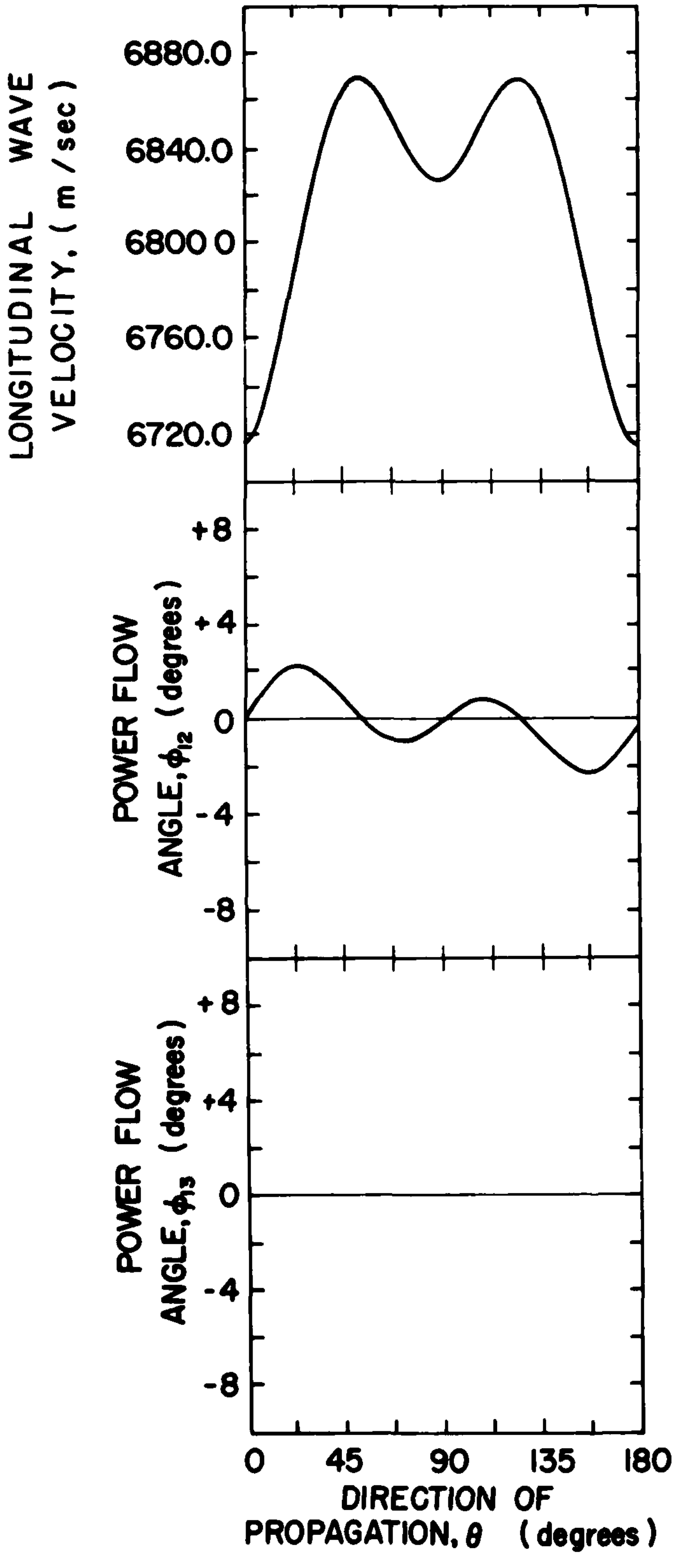

X-PLANE
$Ba_2NaNb_5O_{15}$
SECOND SHEAR WAVE VELOCITY, (m /sec)
3680.0
3640.0
3600.0
3560.0
3520.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
4.50
3.50
2.50
1.50
0.50
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)


LONGITUDINAL WAVE VELOCITY, (m / sec)
6700.0
6500.0
6300.0
6100.0
5900.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Y-PLANE
$Ba_2NaNb_5O_{15}$
$100 \times \delta v/v$
$1.8\times10^{+1}$
$1.4\times10^{+1}$
$1.0\times10^{+1}$
$0.6\times10^{+1}$
$0.2\times10^{+1}$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

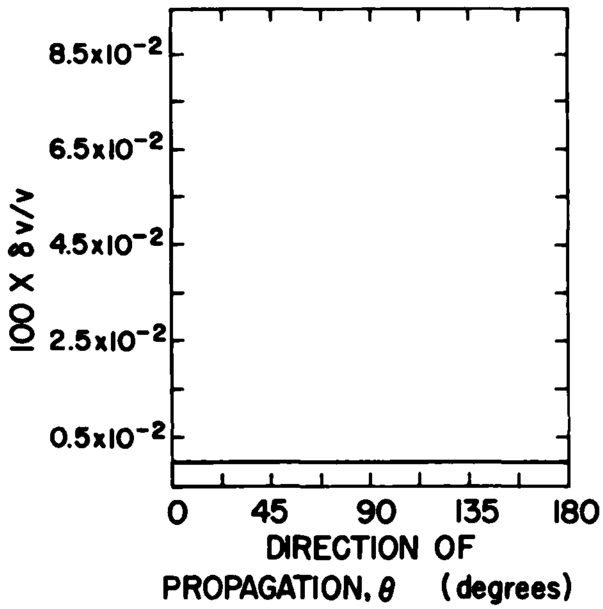


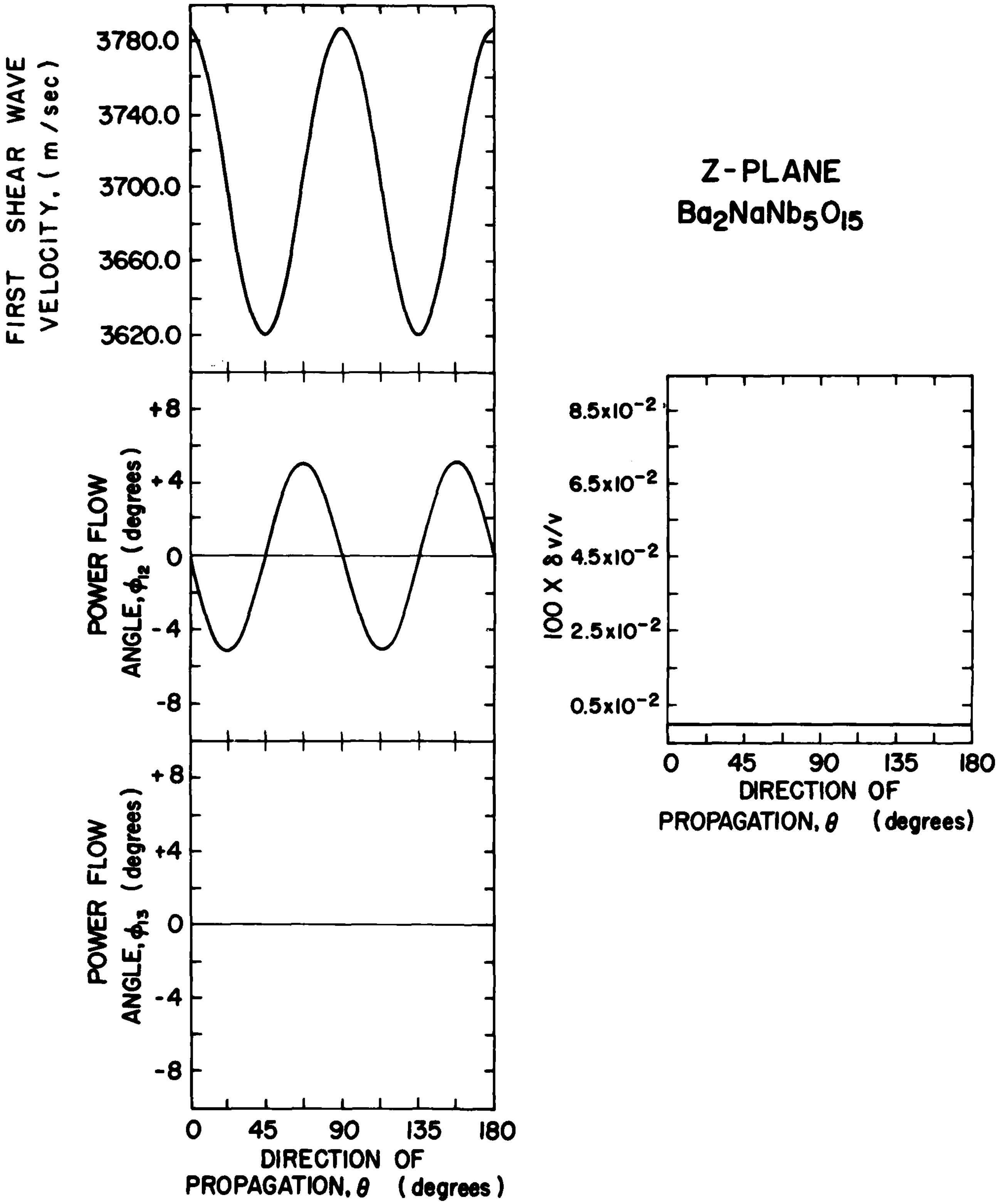
Y-PLANE
$Ba_2NaNb_5O_{15}$
FIRST SHEAR WAVE VELOCITY, (m/sec)
3860.0
3780.0
3700.0
3620.0
3540.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

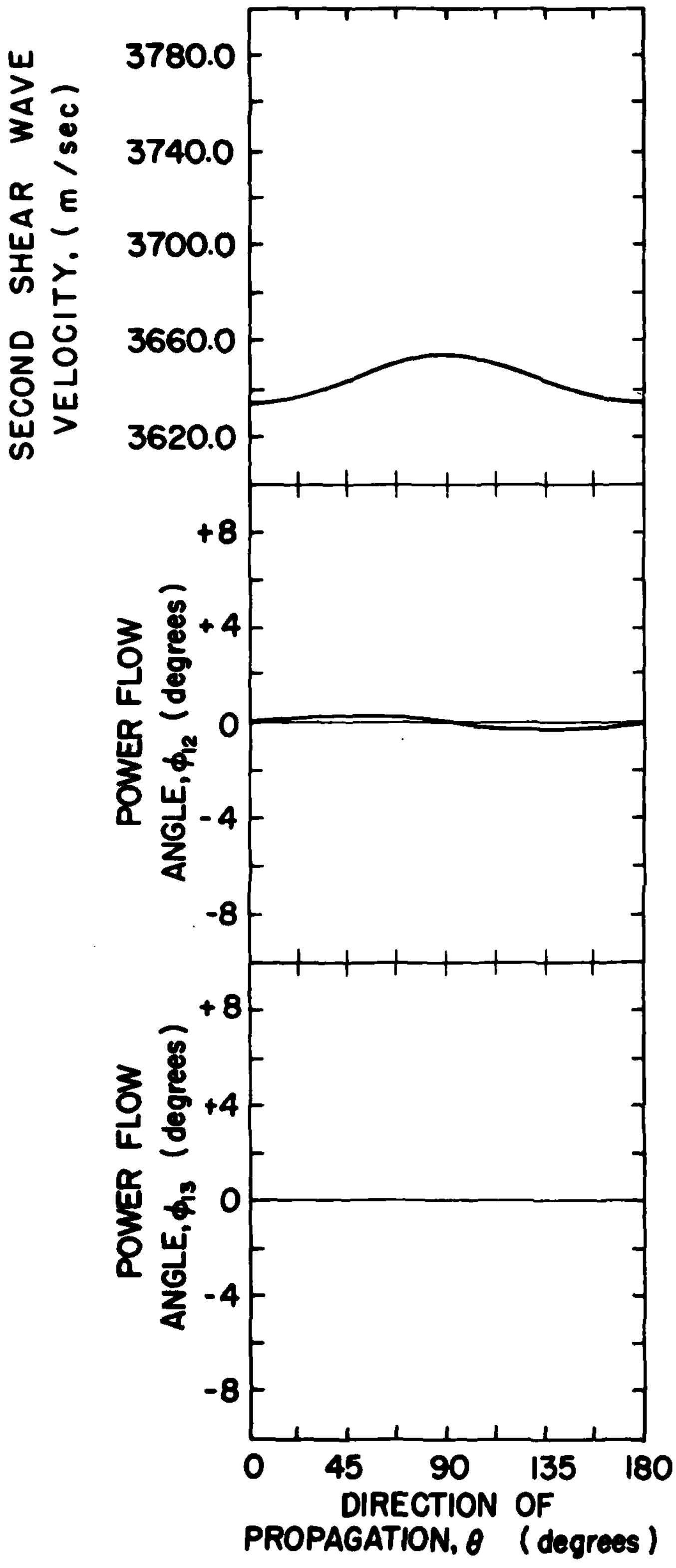

Y-PLANE
Ba2NaNb5O15
SECOND SHEAR WAVE
VELOCITY, (m /sec)
3680.0
3640.0
3600.0
3560.0
3520.0
POWER FLOW
ANGLE, φ12 (degrees)
+8
+4
0
-4
-8
POWER FLOW
ANGLE, φ13 (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF
PROPAGATION, θ (degrees)
100 X δv/v
3.60
2.80
2.00
1.20
0.40
0
45
90
135
180
DIRECTION OF
PROPAGATION, θ (degrees)



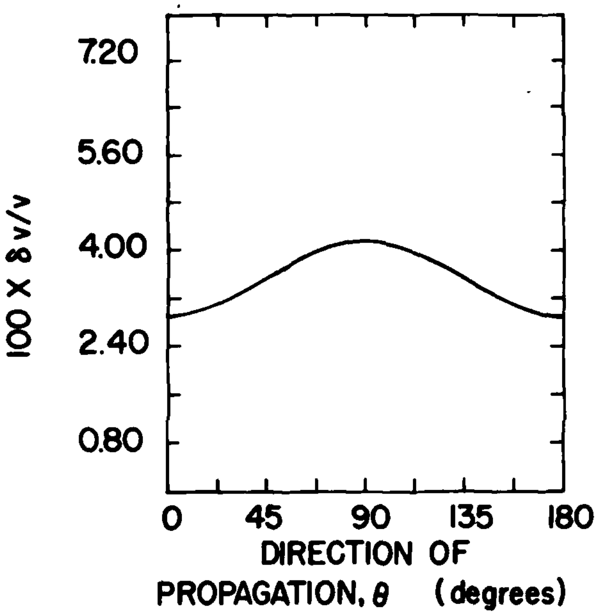
Z-PLANE
$Ba_2NaNb_5O_{15}$

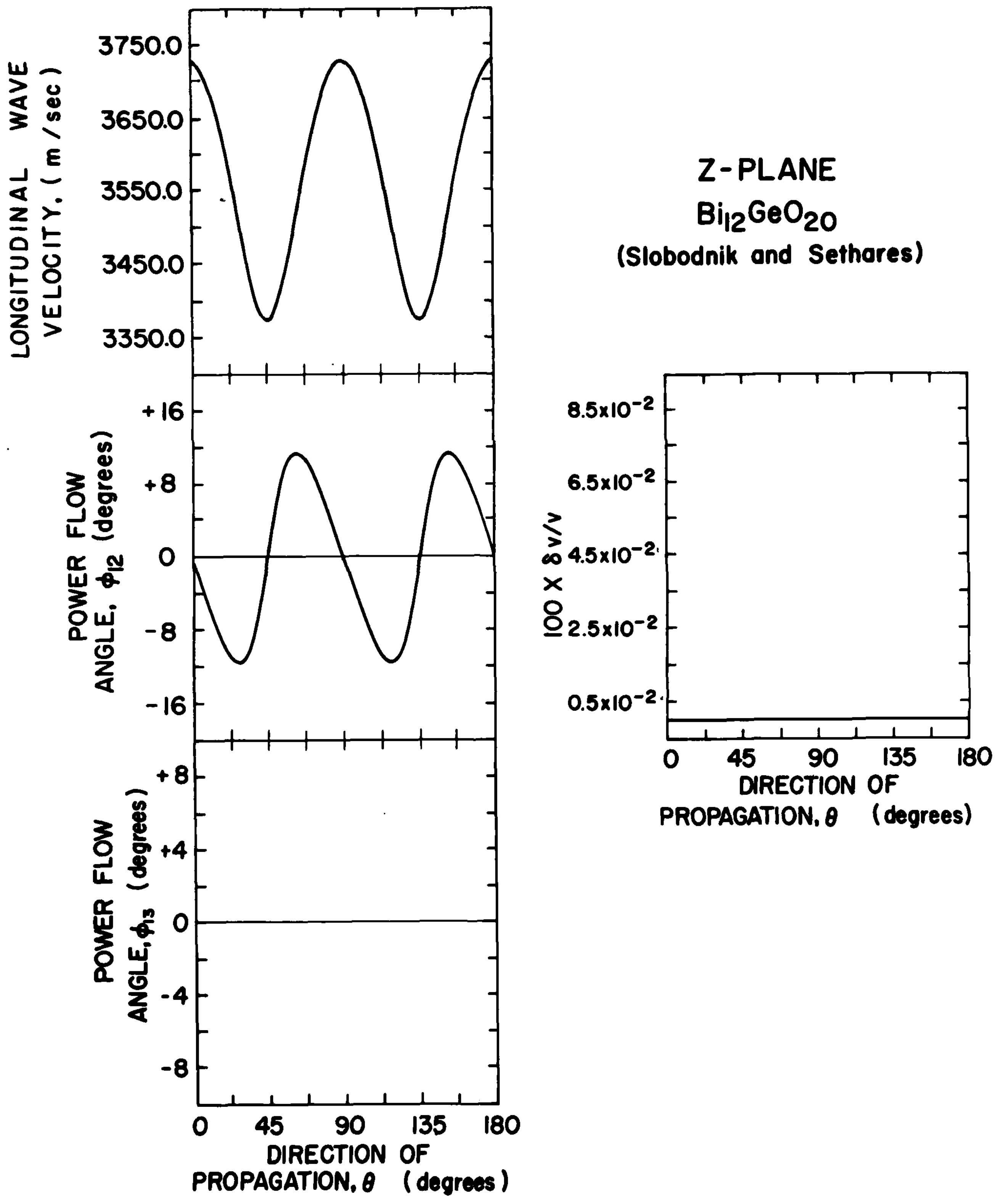



Z-PLANE
$Ba_2NaNb_5O_{15}$
FIRST SHEAR WAVE VELOCITY, (m/sec)
3780.0
3740.0
3700.0
3660.0
3620.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

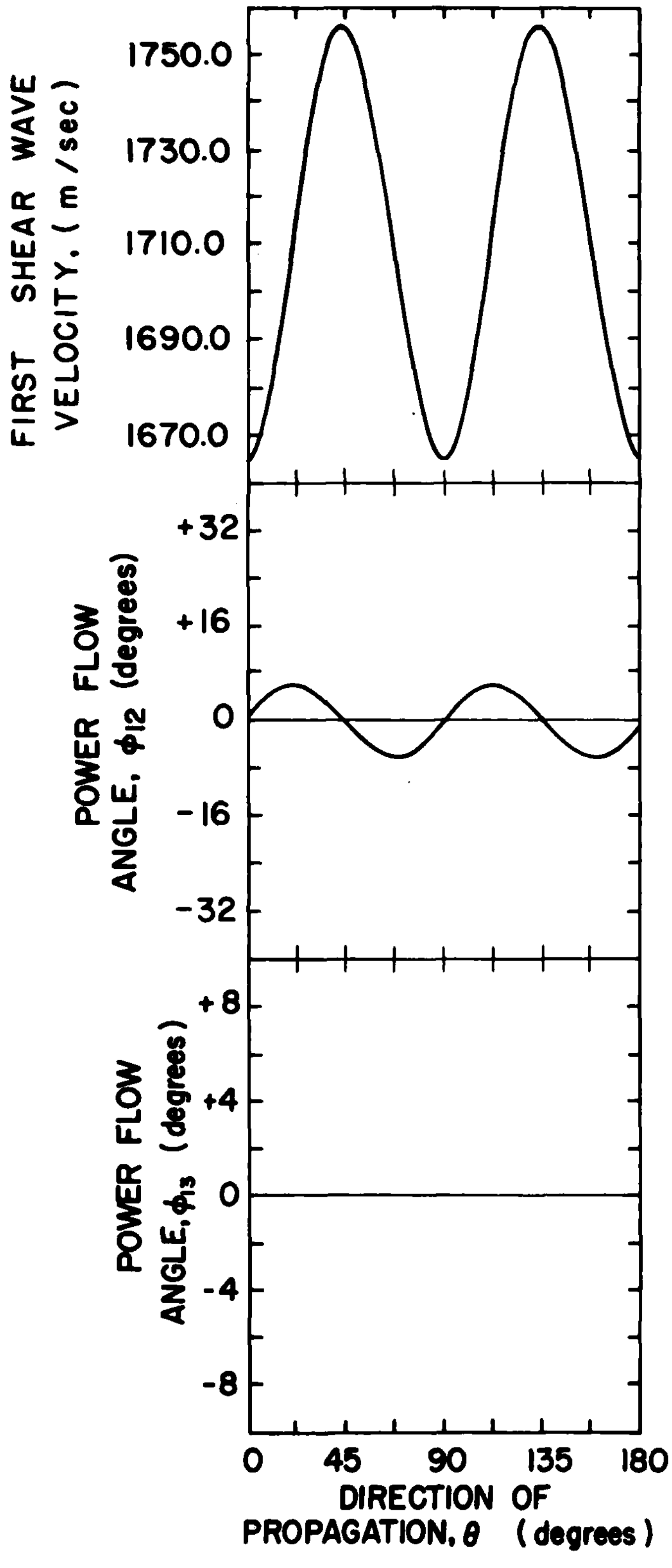


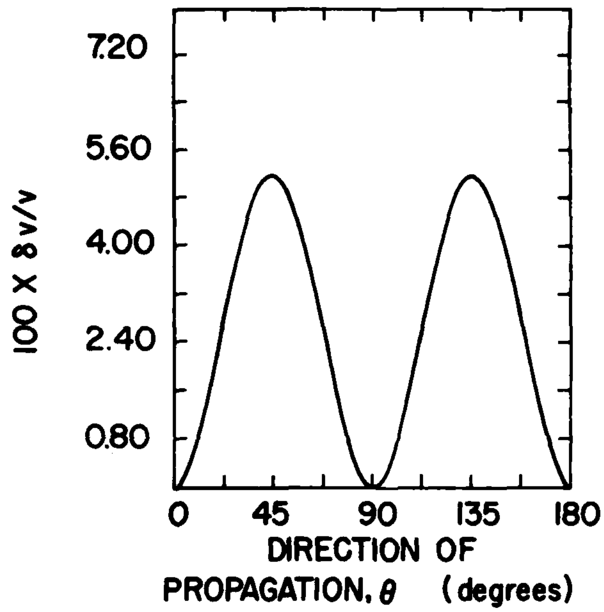
Z-PLANE
$Ba_2NaNb_5O_{15}$

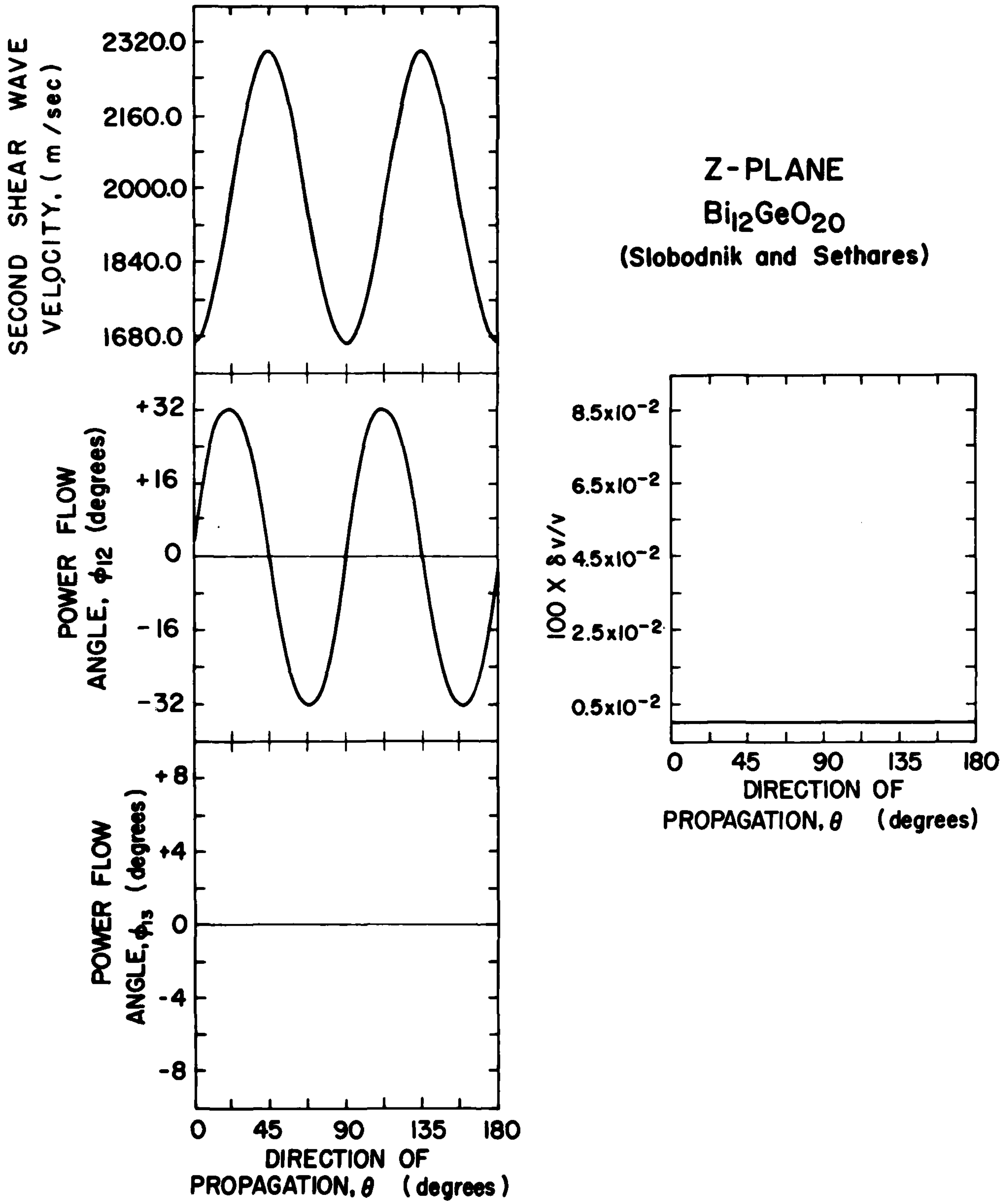



Z-PLANE
$Bi_{12}GeO_{20}$
(Slobodnik and Sethares)
LONGITUDINAL WAVE VELOCITY, (m/sec)
3750.0
3650.0
3550.0
3450.0
3350.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

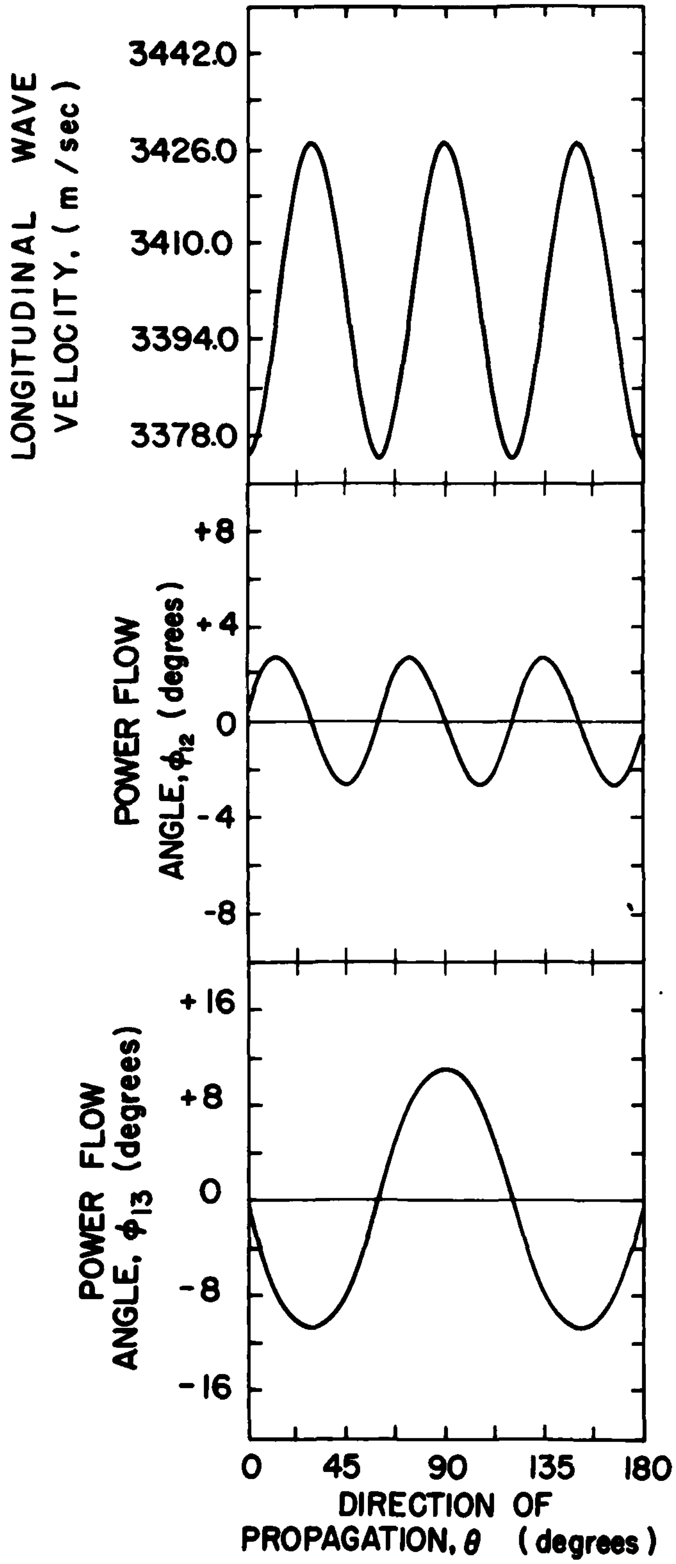
Z-PLANE
$Bi_{12}GeO_{20}$
(Slobodnik and Sethares)







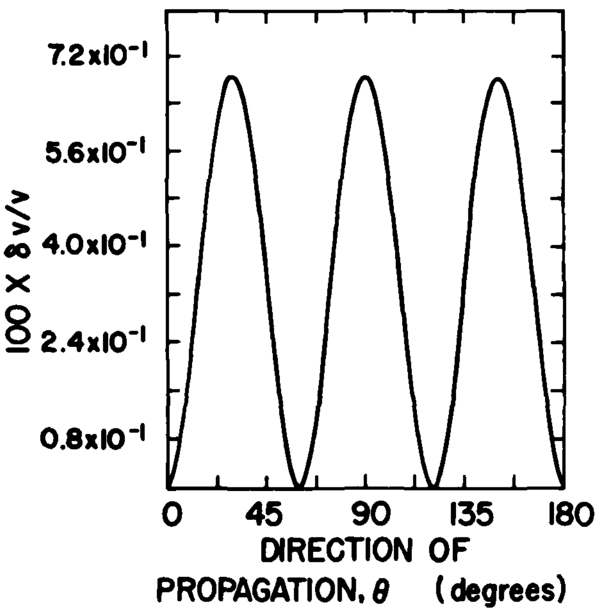
SECOND SHEAR WAVE VELOCITY, (m /sec)
2320.0
2160.0
2000.0
1840.0
1680.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+32
+16
0
-16
-32
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
$Bi_{12}GeO_{20}$
(Slobodnik and Sethares)
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



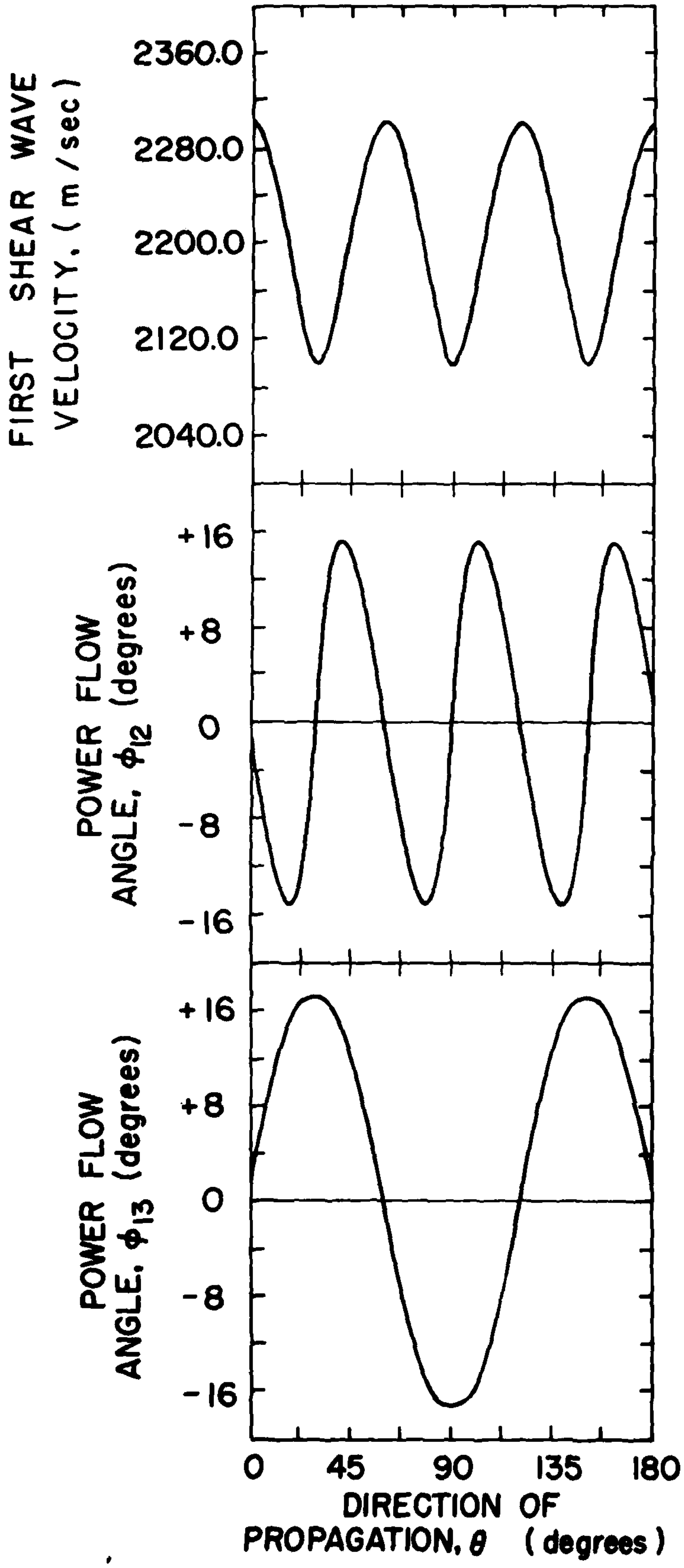
111-PLANE

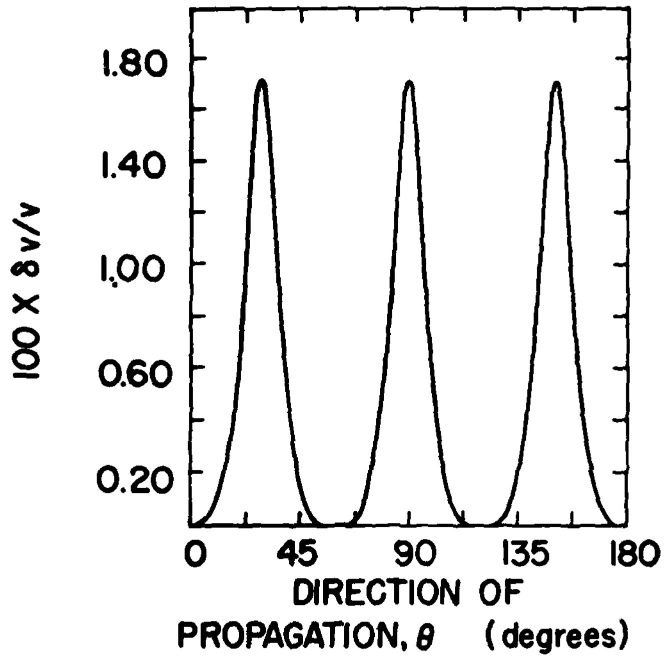
$Bi_{12}GeO_{20}$

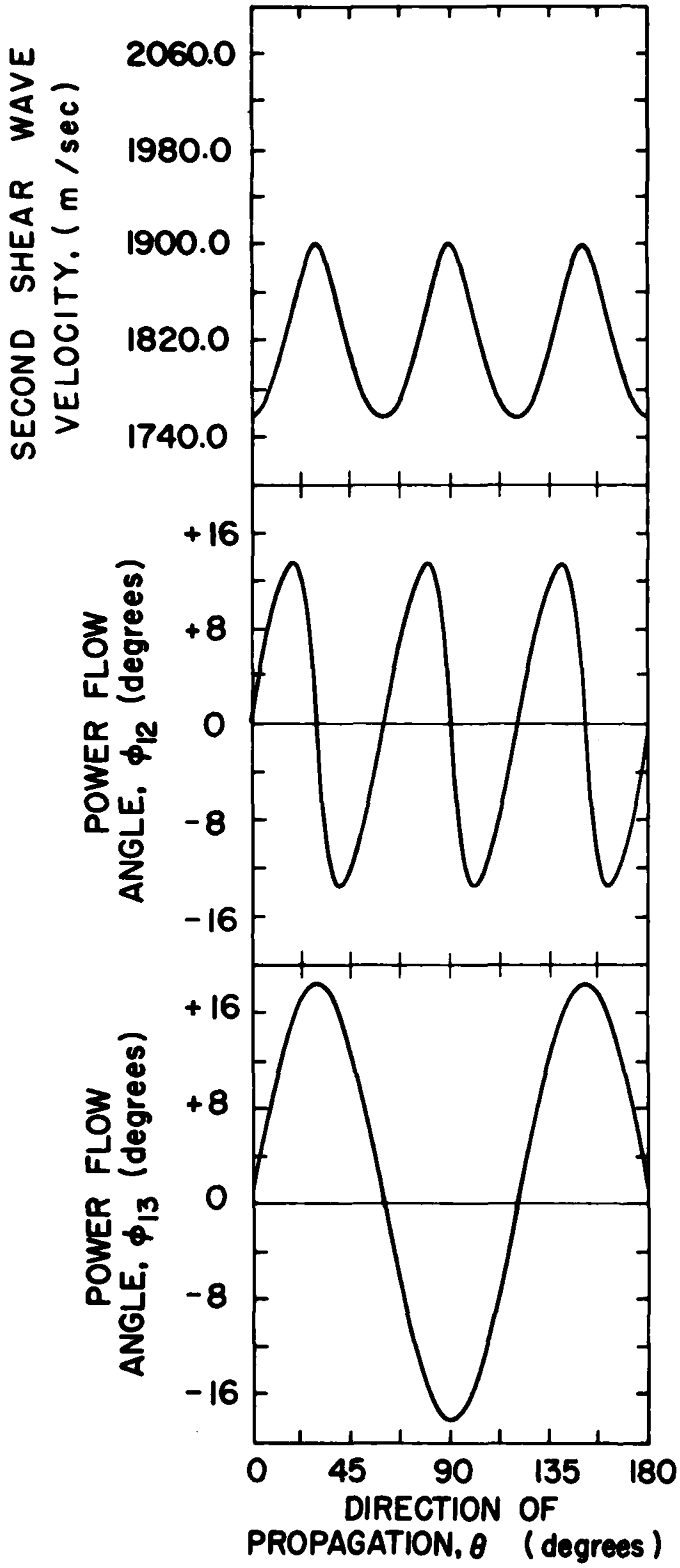
(Slobodnik and Sethares)



111-PLANE
$Bi_{12}GeO_{20}$
(Slobodnik and Sethares)



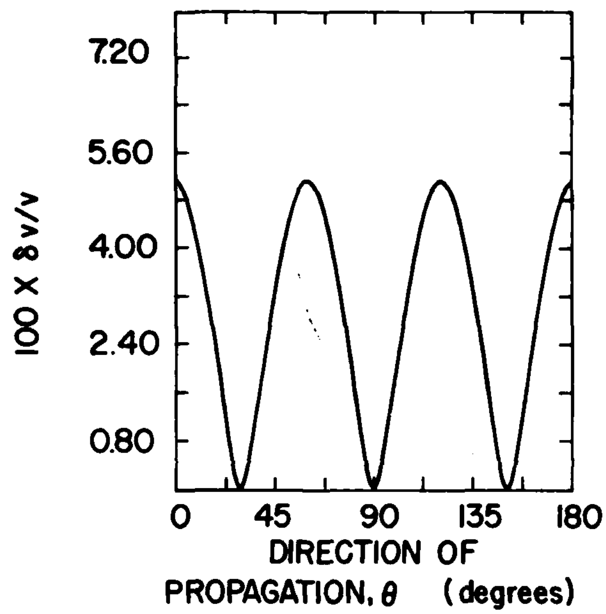


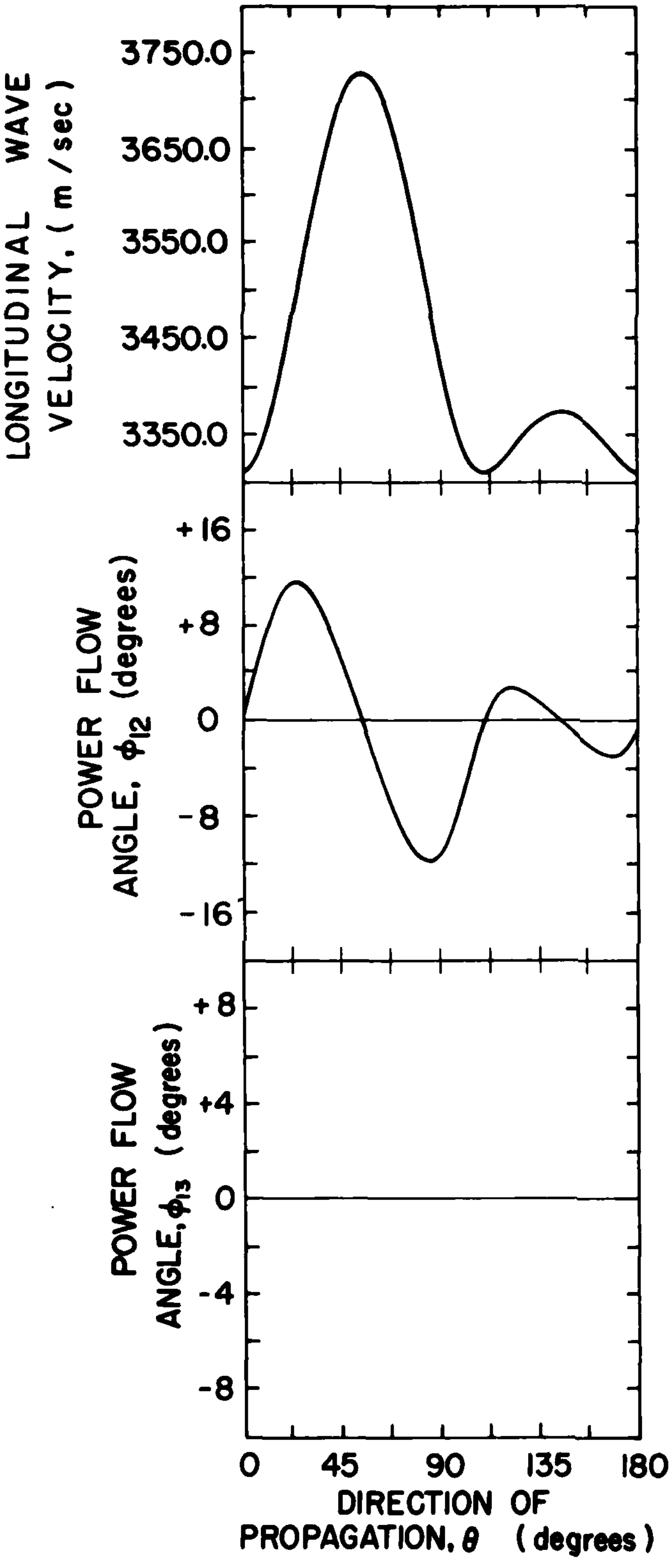


III-PLANE

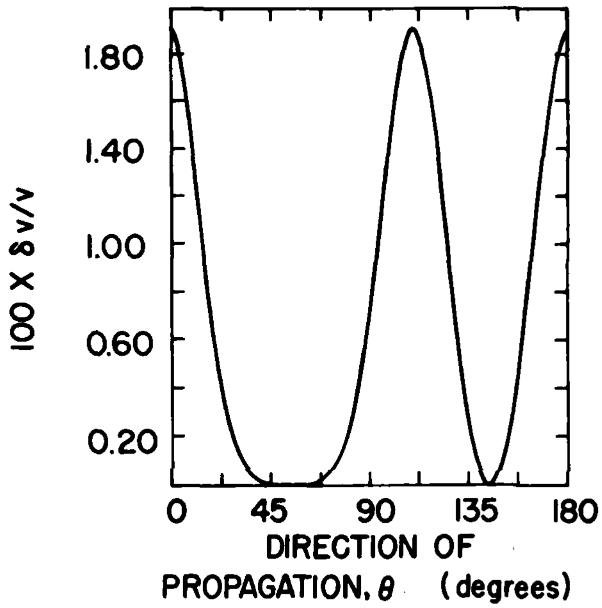
$Bi_{12}GeO_{20}$

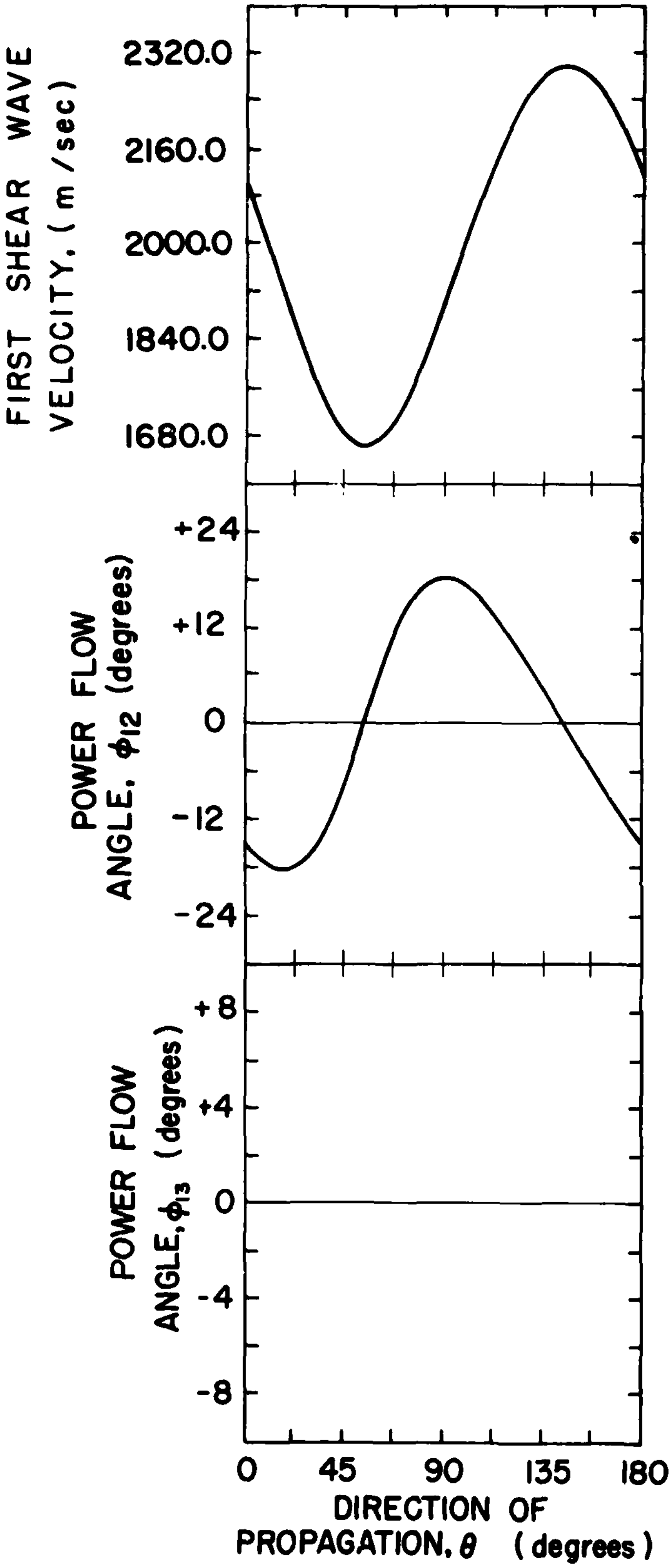
(Slobodnik and Sethares)



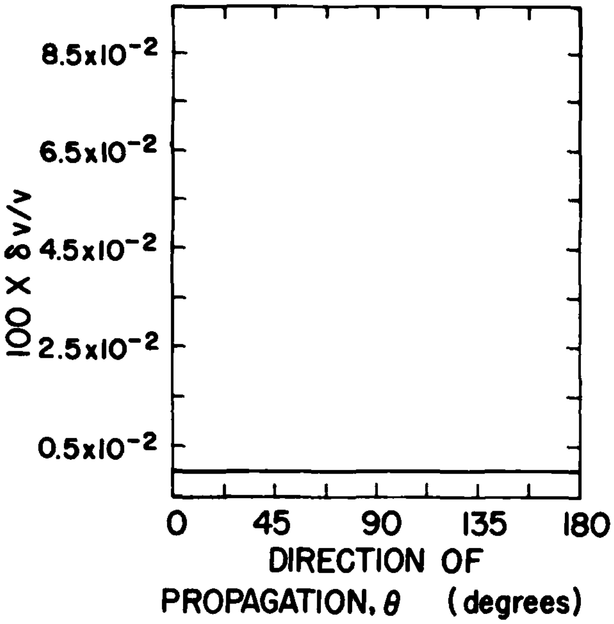


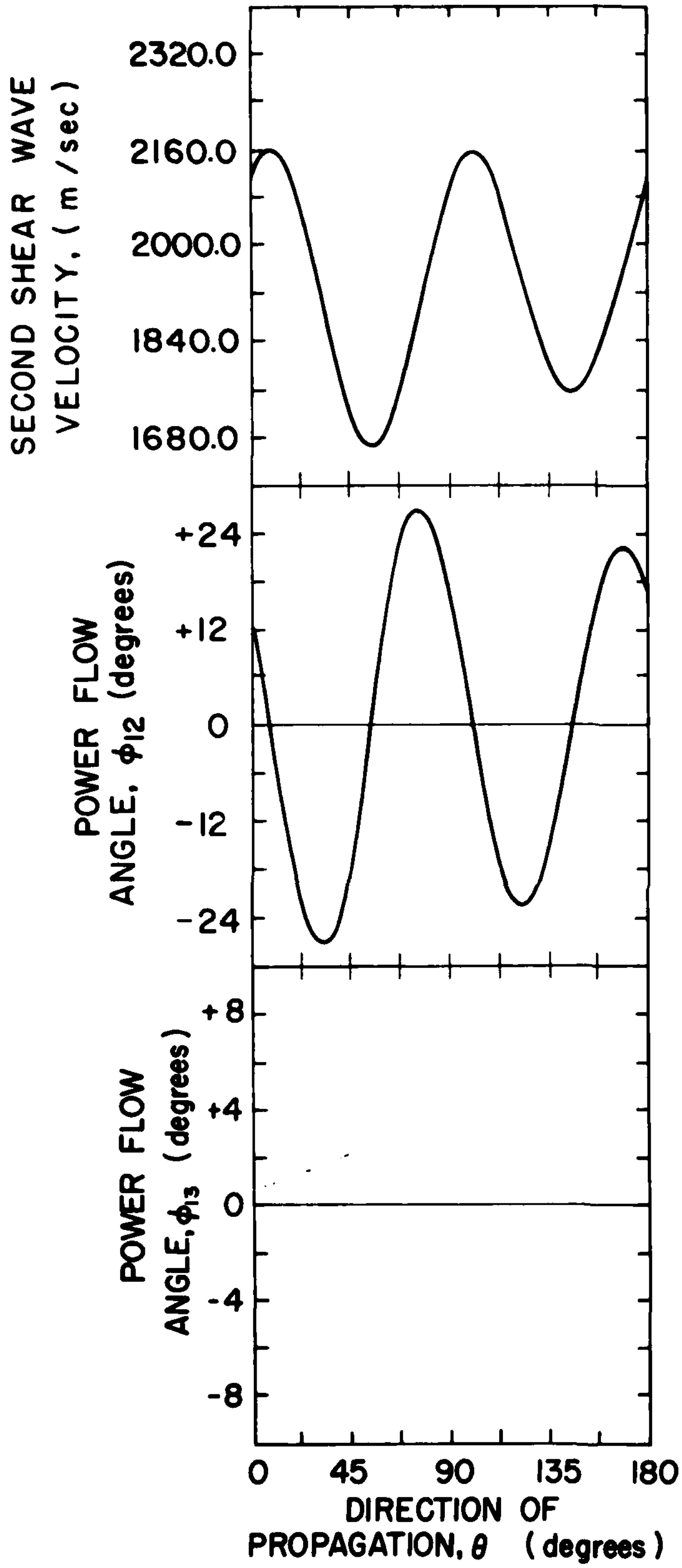
110-PLANE
$Bi_{12}GeO_{20}$
(Slobodnik and Sethares)



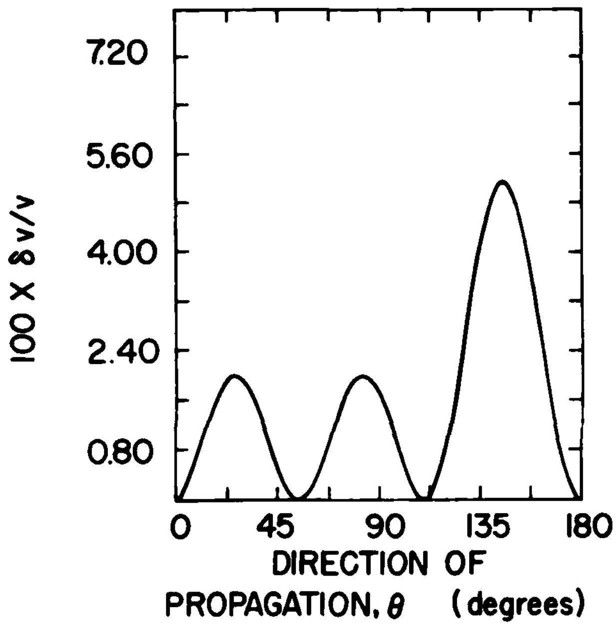


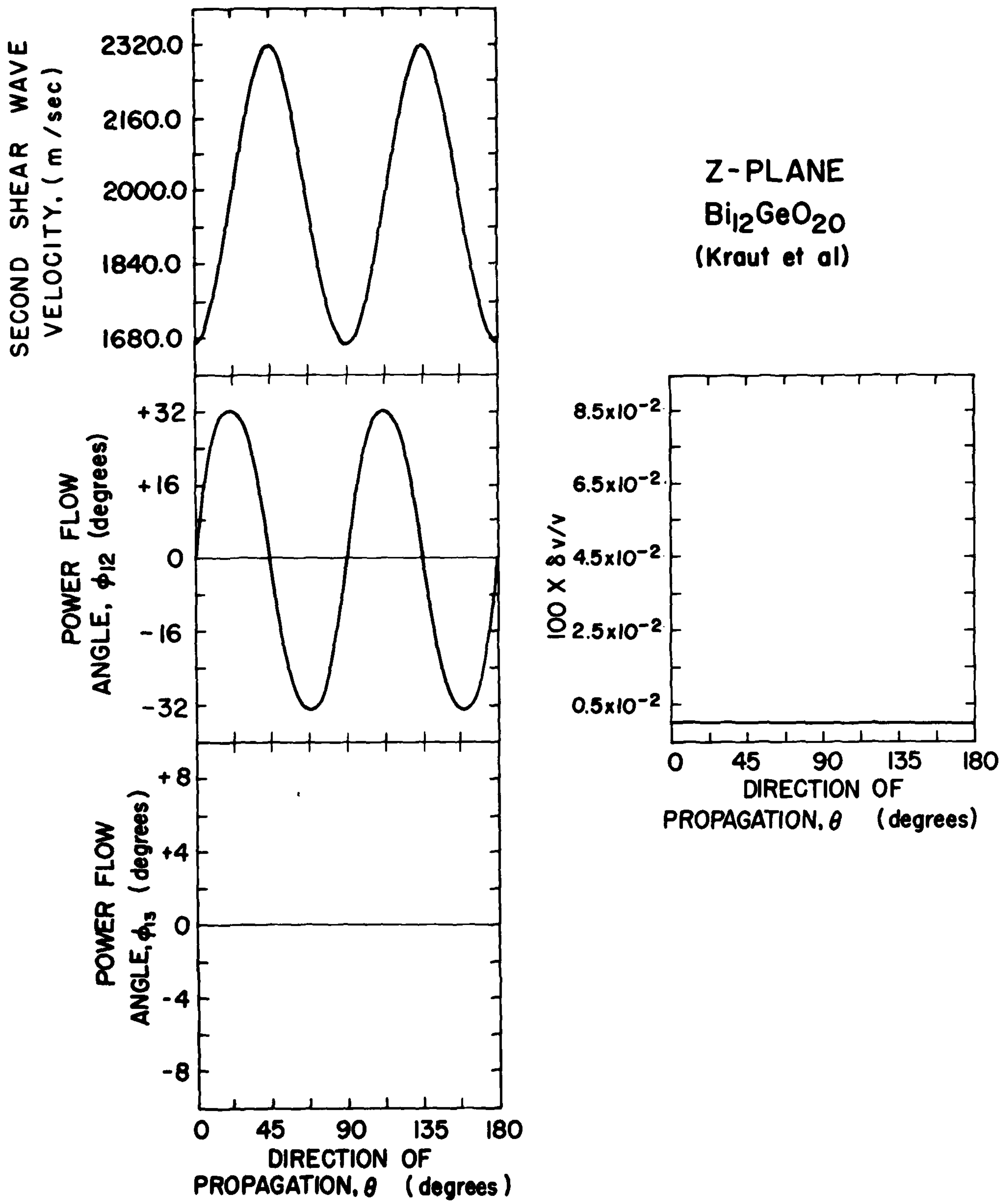
110 - PLANE
$Bi_{12}GeO_{20}$
(Slobodnik and Sethares)

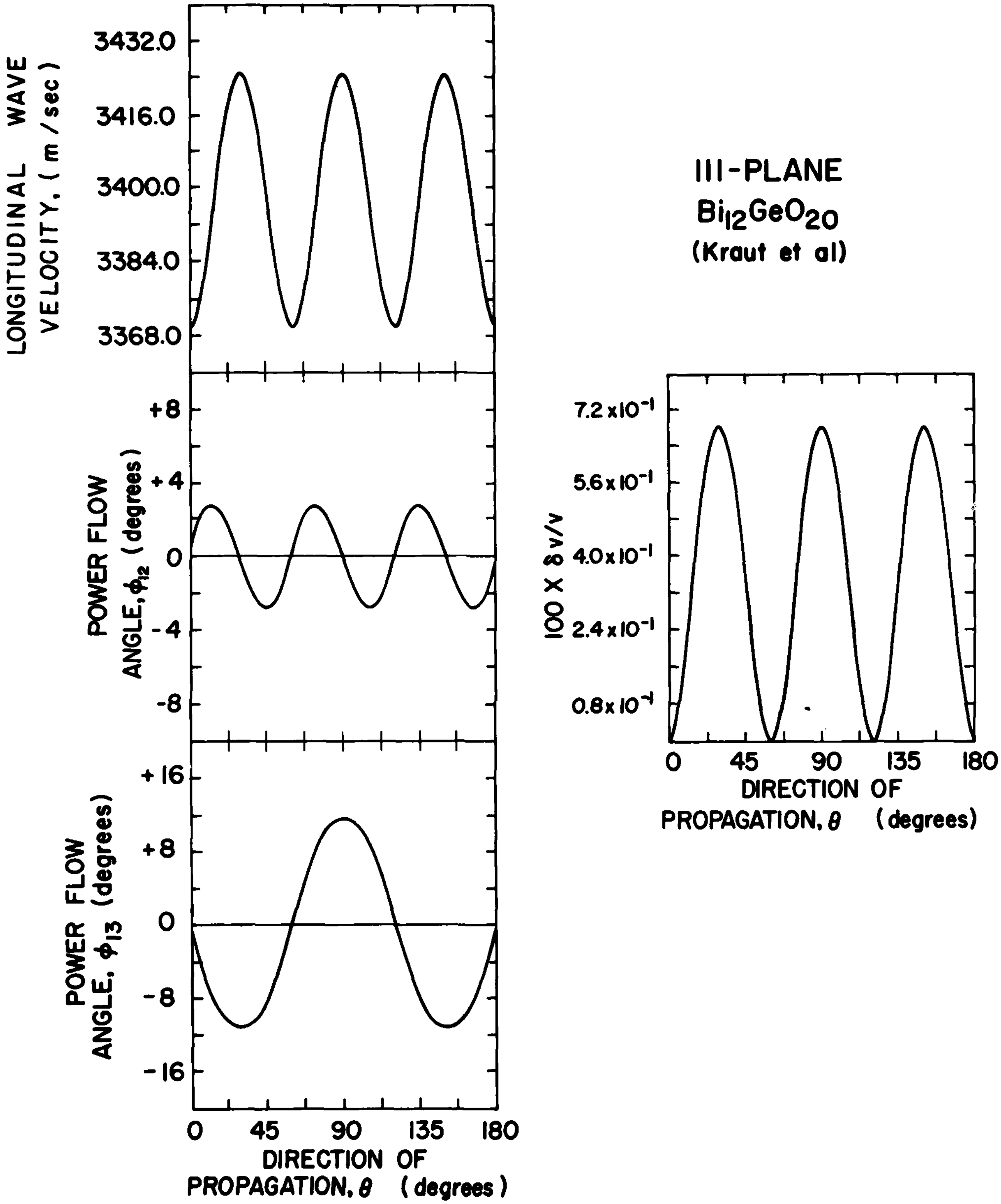


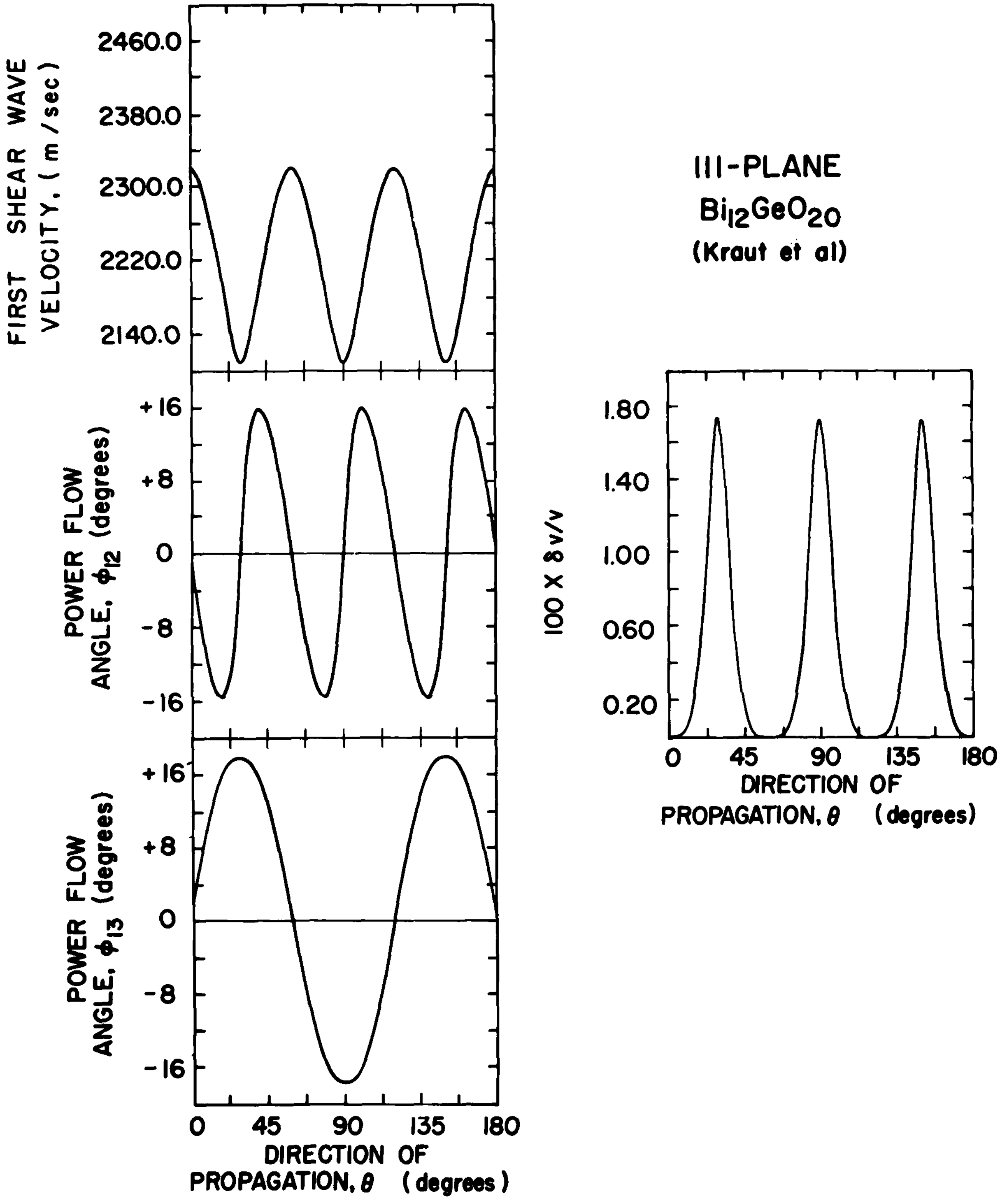


110 - PLANE
$Bi_{12}GeO_{20}$
(Slobodnik and Sethares)

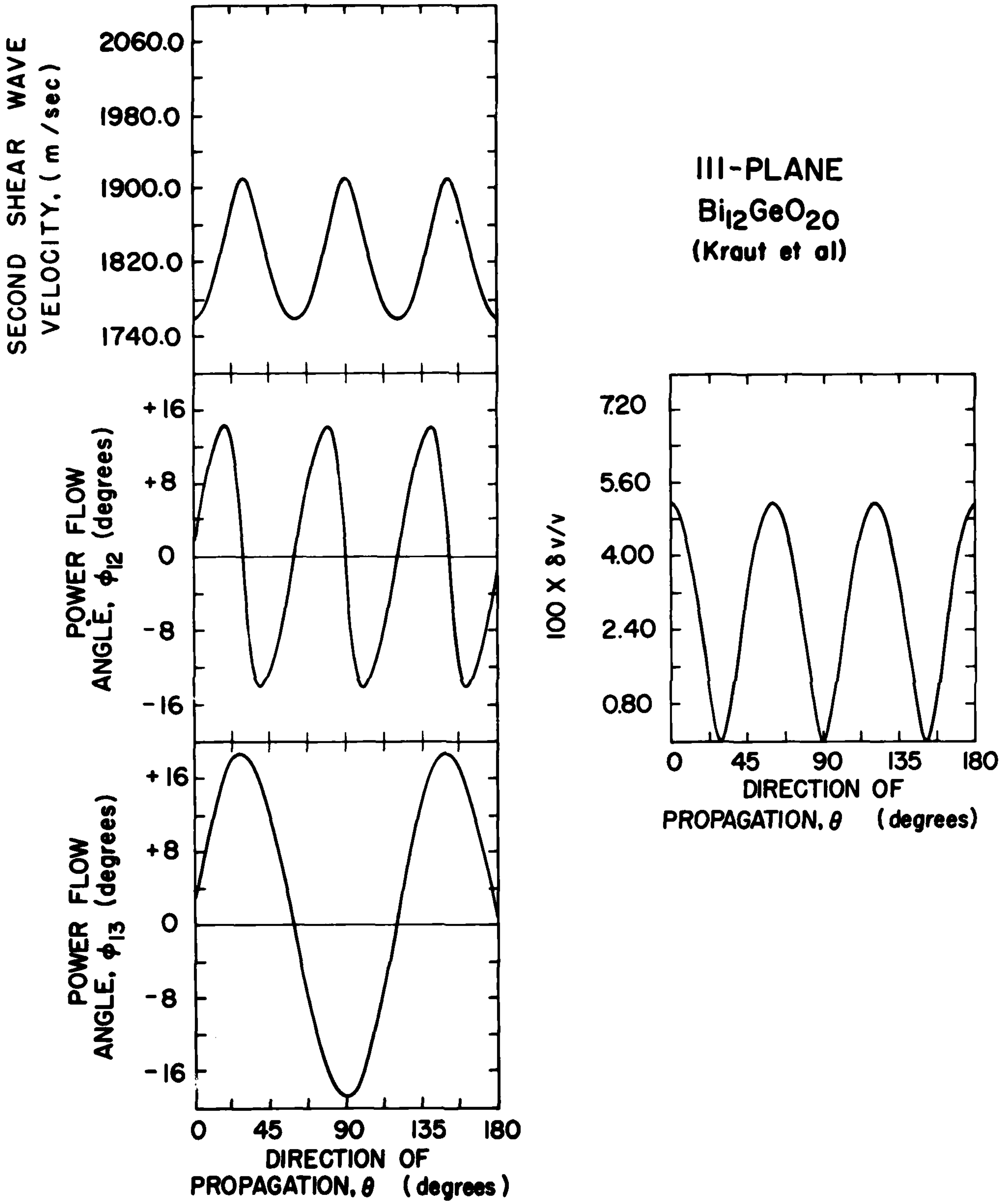


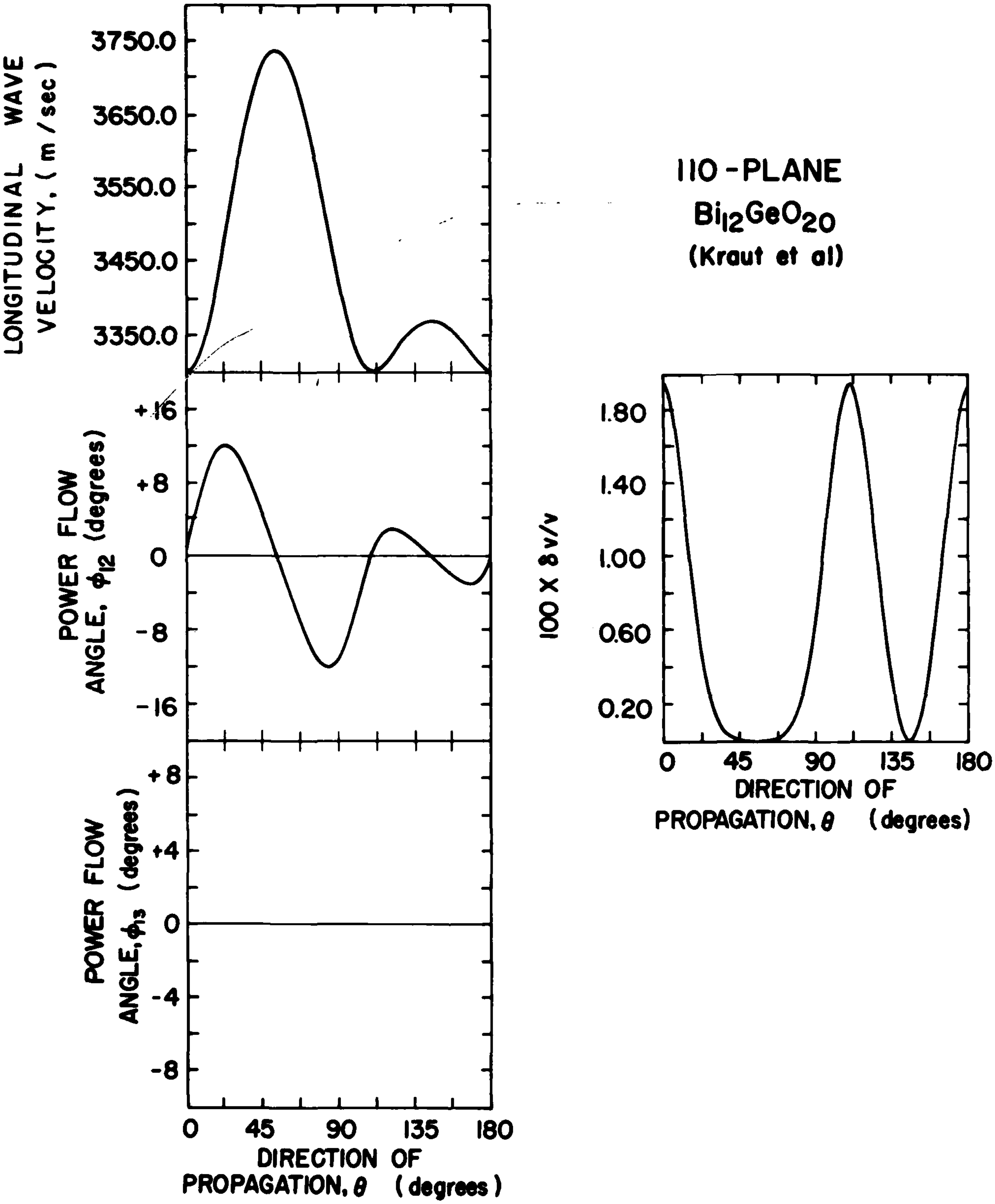

SECOND SHEAR WAVE VELOCITY, (m/sec)
2320.0
2160.0
2000.0
1840.0
1680.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+32
+16
0
-16
-32
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
$Bi_{12}GeO_{20}$
(Kraut et al)
100 X $\delta v/v$
$8.5x10^{-2}$
$6.5x10^{-2}$
$4.5x10^{-2}$
$2.5x10^{-2}$
$0.5x10^{-2}$
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)


LONGITUDINAL WAVE VELOCITY, (m / sec)
3432.0
3416.0
3400.0
3384.0
3368.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
$Bi_{12}GeO_{20}$
(Kraut et al)
$100 \times \delta v/v$
7.2×10^{-1}
5.6×10^{-1}
4.0×10^{-1}
2.4×10^{-1}
0.8×10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

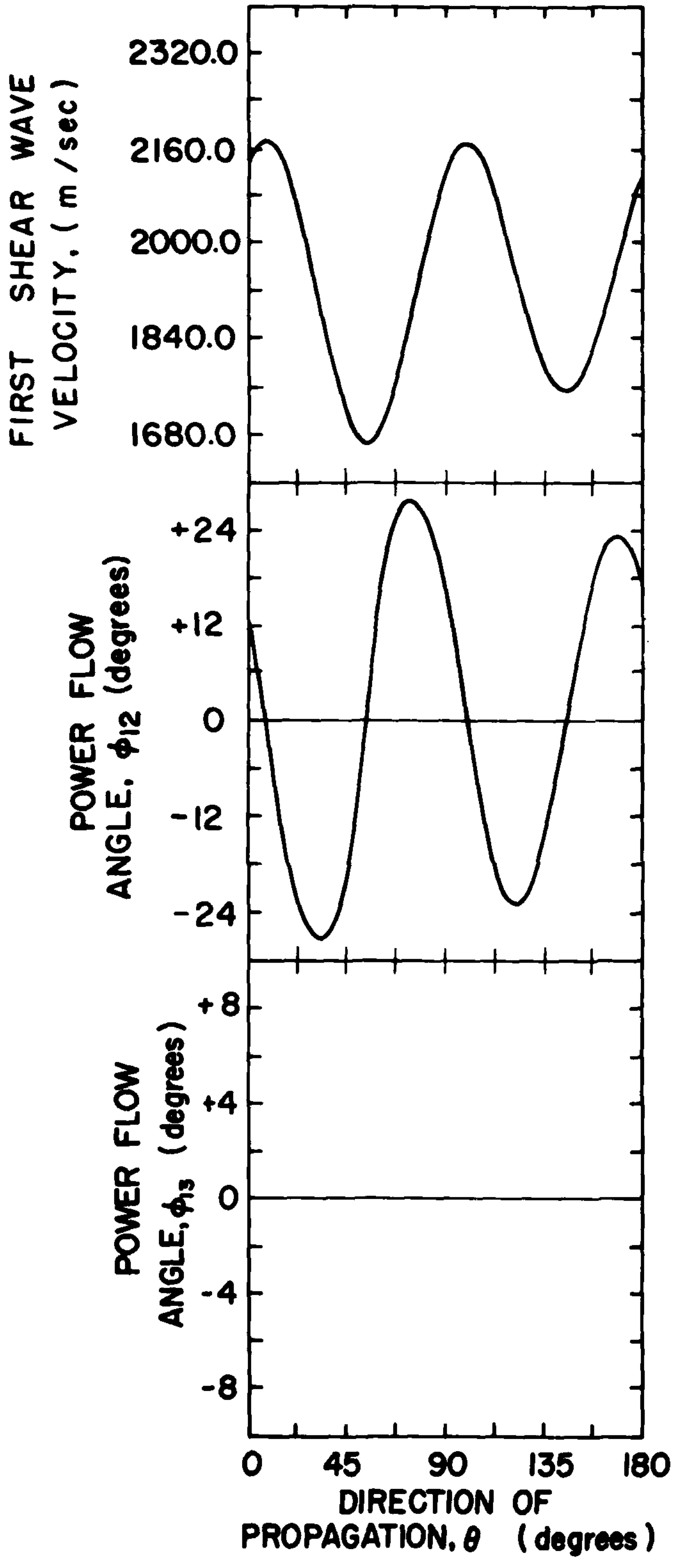


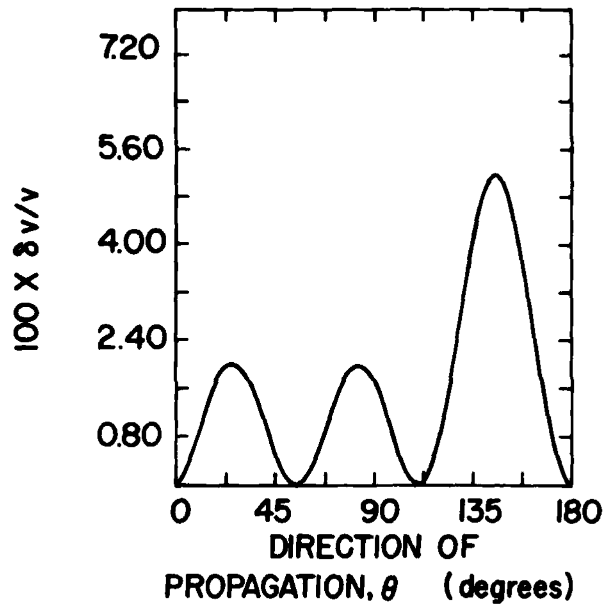
III-PLANE
$Bi_{12}GeO_{20}$
(Kraut et al)
FIRST SHEAR WAVE VELOCITY, (m/sec)
2460.0
2380.0
2300.0
2220.0
2140.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
1.80
1.40
1.00
0.60
0.20
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

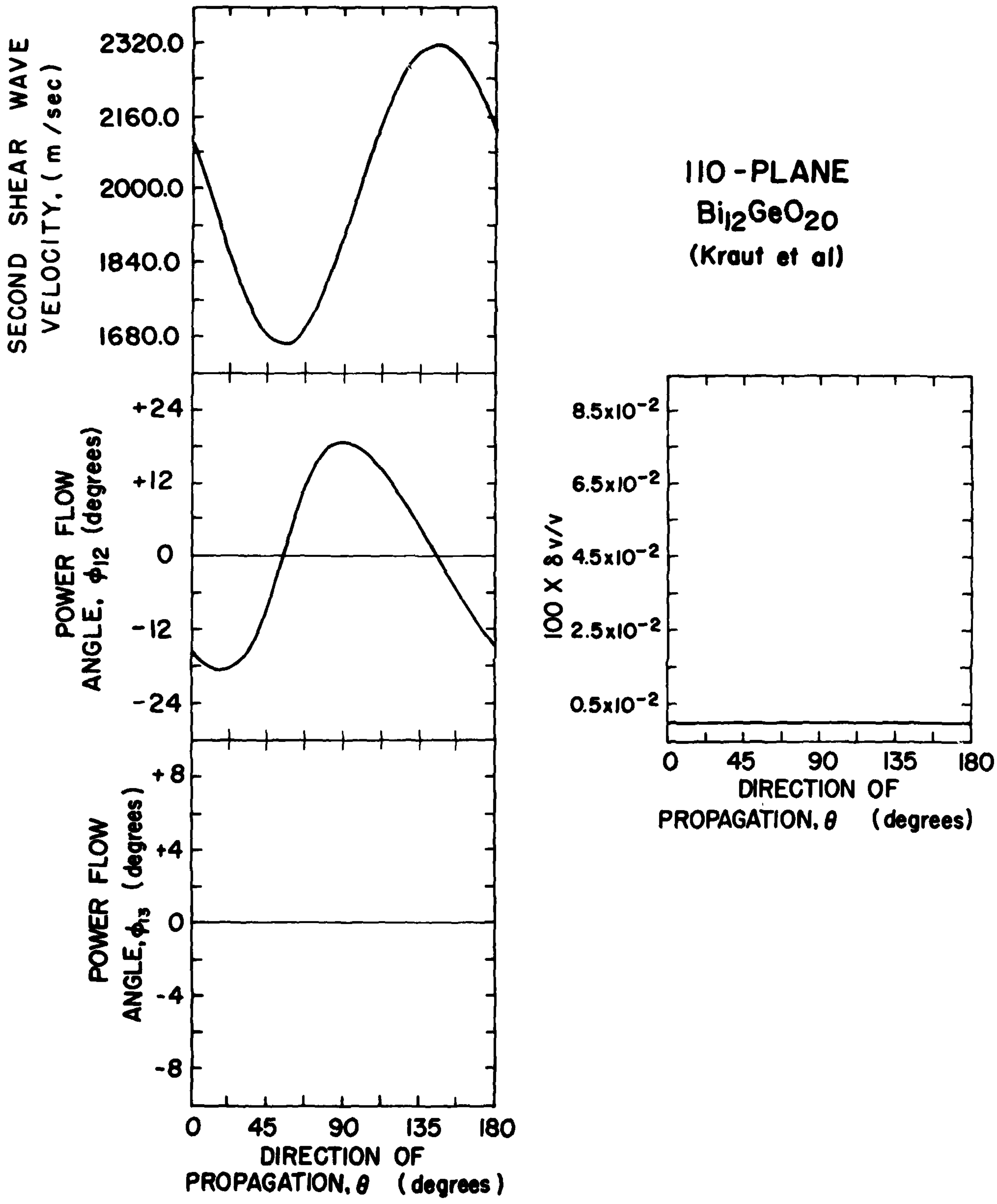

III-PLANE
$Bi_{12}GeO_{20}$
(Kraut et al)
SECOND SHEAR WAVE VELOCITY, (m/sec)
2060.0
1980.0
1900.0
1820.0
1740.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
7.20
5.60
4.00
2.40
0.80
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


LONGITUDINAL WAVE VELOCITY, (m / sec)
3750.0
3650.0
3550.0
3450.0
3350.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110 - PLANE
$Bi_{12}GeO_{20}$
(Kraut et al)
100 X δv/v
1.80
1.40
1.00
0.60
0.20
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

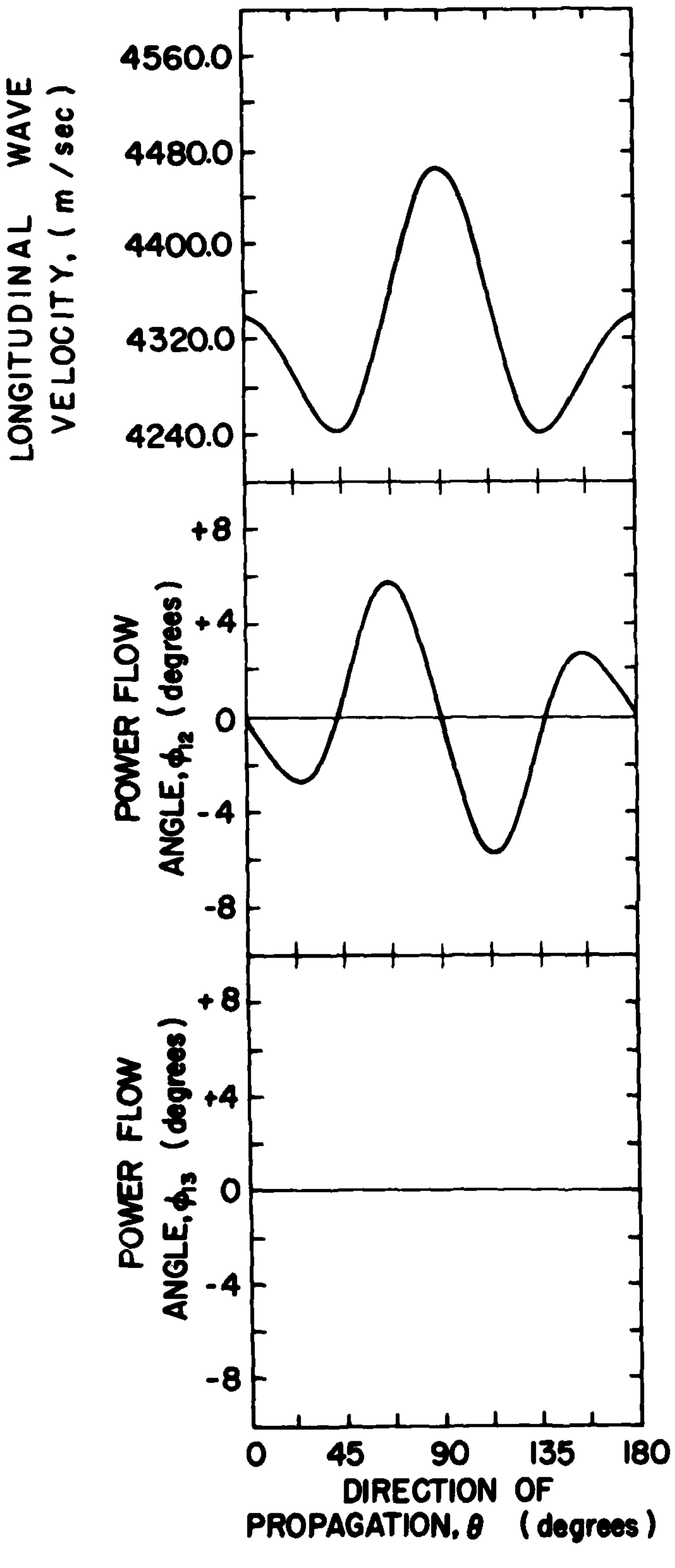
110 - PLANE
$Bi_{12}GeO_{20}$
(Kraut et al)

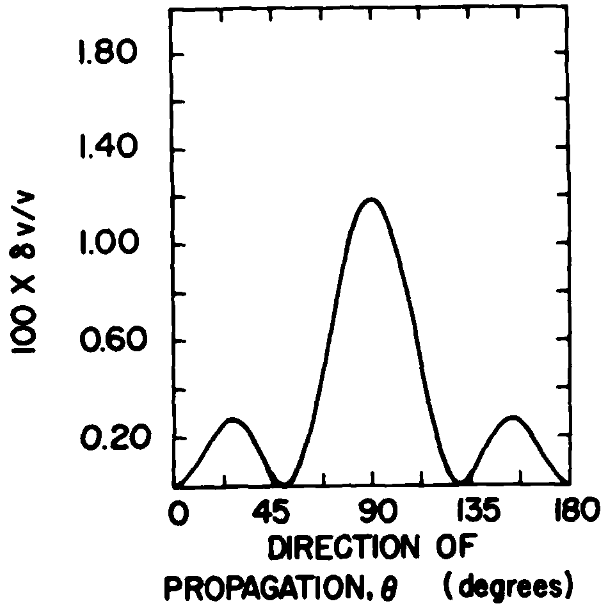


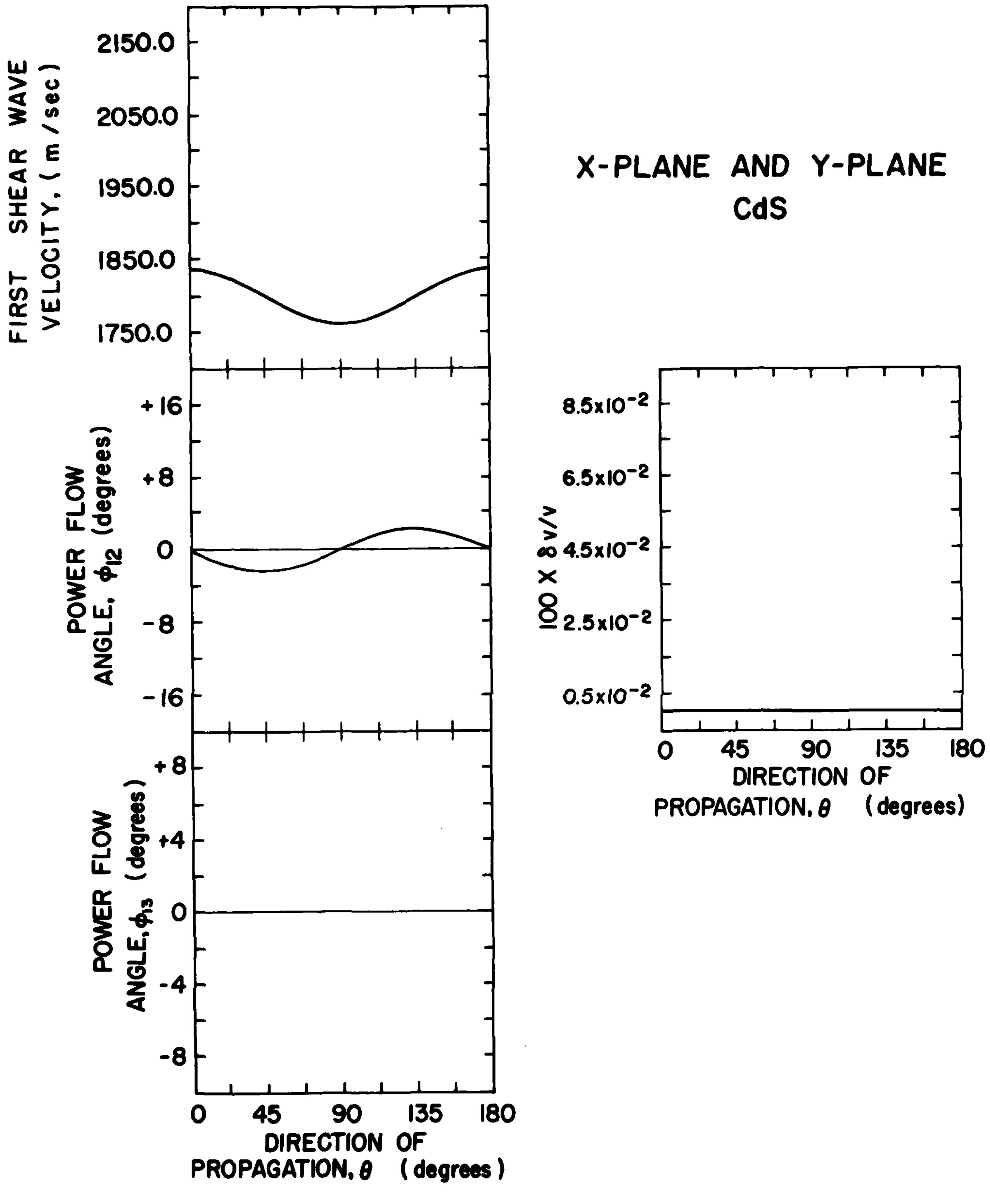


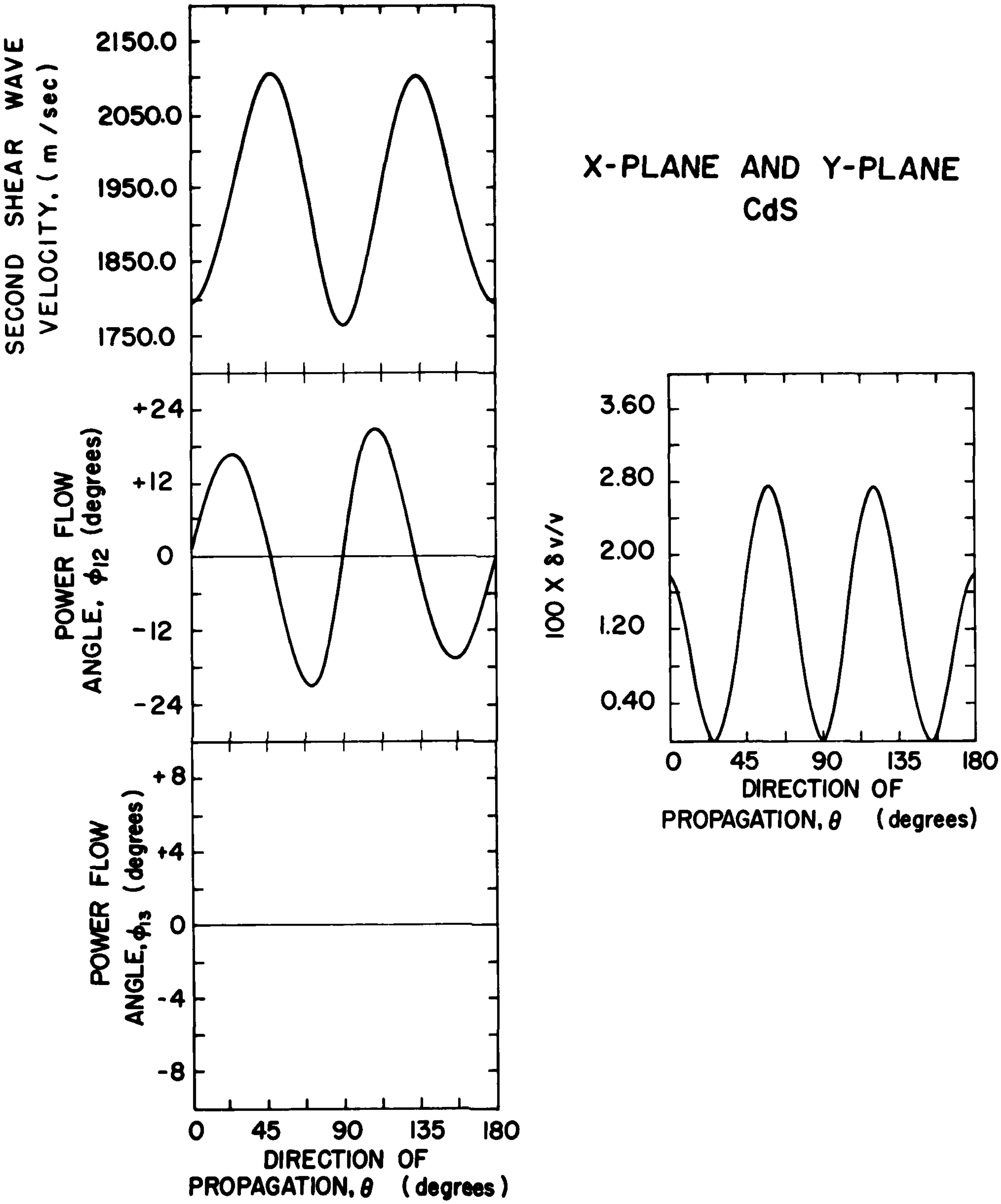

110-PLANE
Bi12GeO20
(Kraut et al)
SECOND SHEAR WAVE VELOCITY, (m/sec)
2320.0
2160.0
2000.0
1840.0
1680.0
POWER FLOW ANGLE, φ12 (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, φ13 (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X δv/v
8.5x10^-2
6.5x10^-2
4.5x10^-2
2.5x10^-2
0.5x10^-2
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

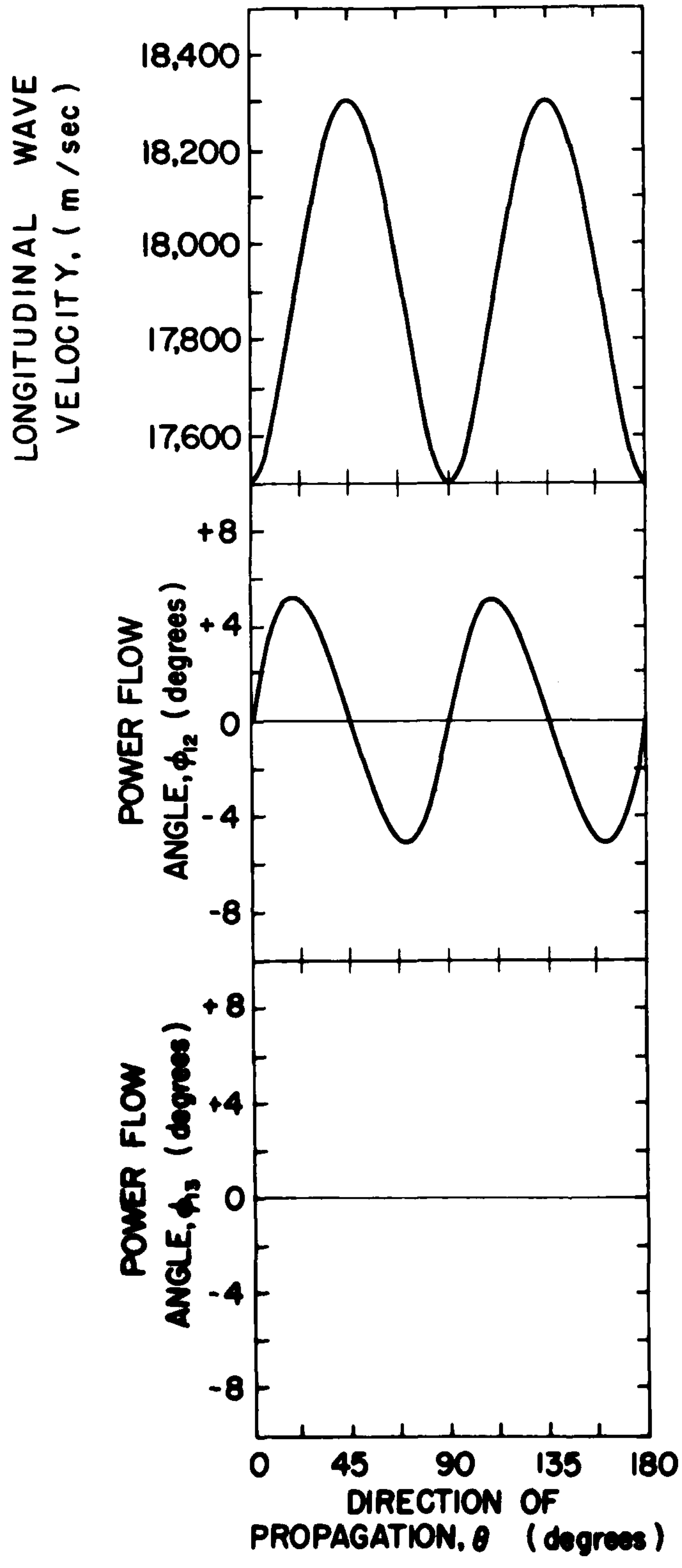
X-PLANE AND Y-PLANE
CdS



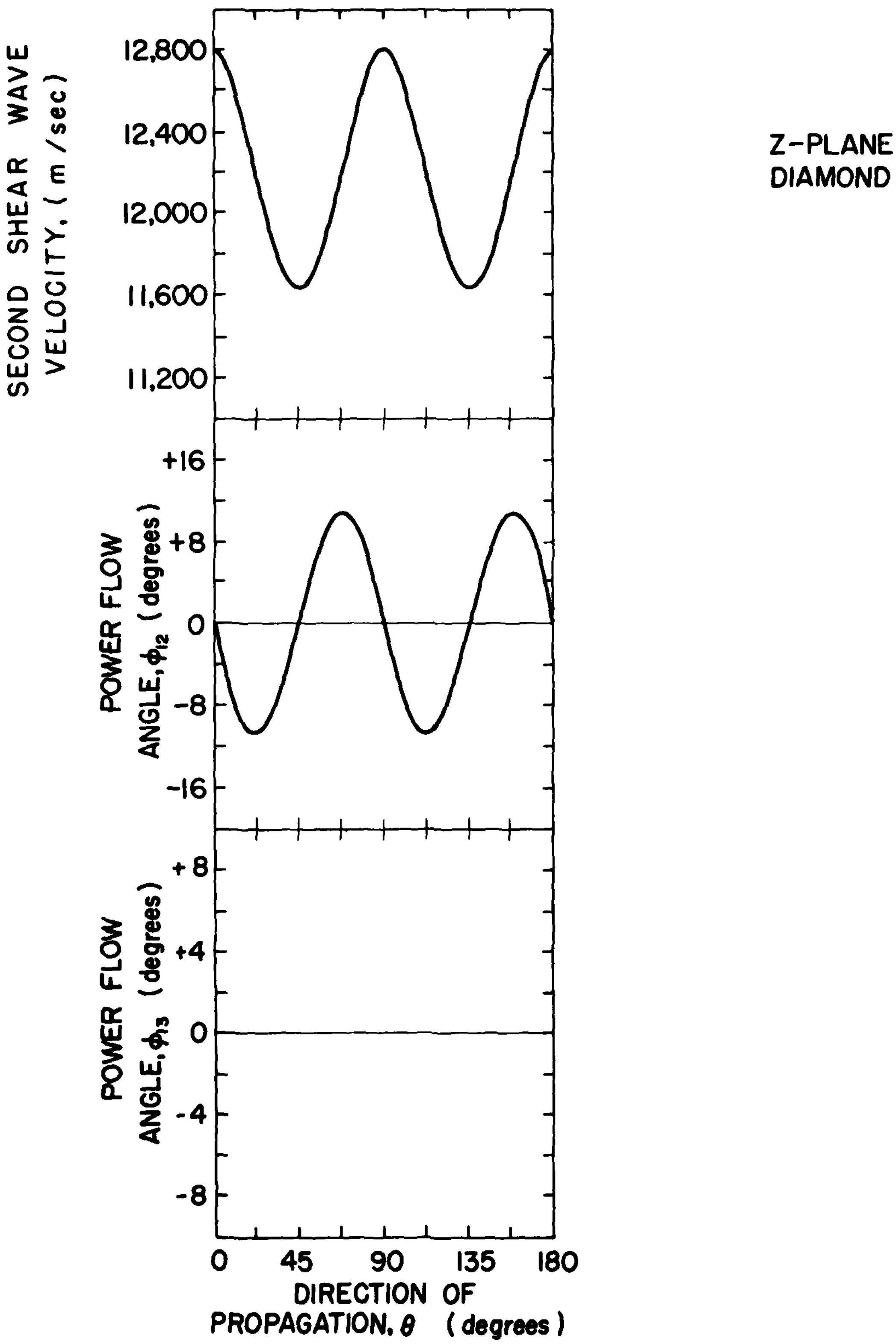



X-PLANE AND Y-PLANE
CdS
FIRST SHEAR WAVE VELOCITY, (m/sec)
2150.0
2050.0
1950.0
1850.0
1750.0
POWER FLOW ANGLE, φ12 (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, φ13 (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X δv/v
8.5x10^-2
6.5x10^-2
4.5x10^-2
2.5x10^-2
0.5x10^-2
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

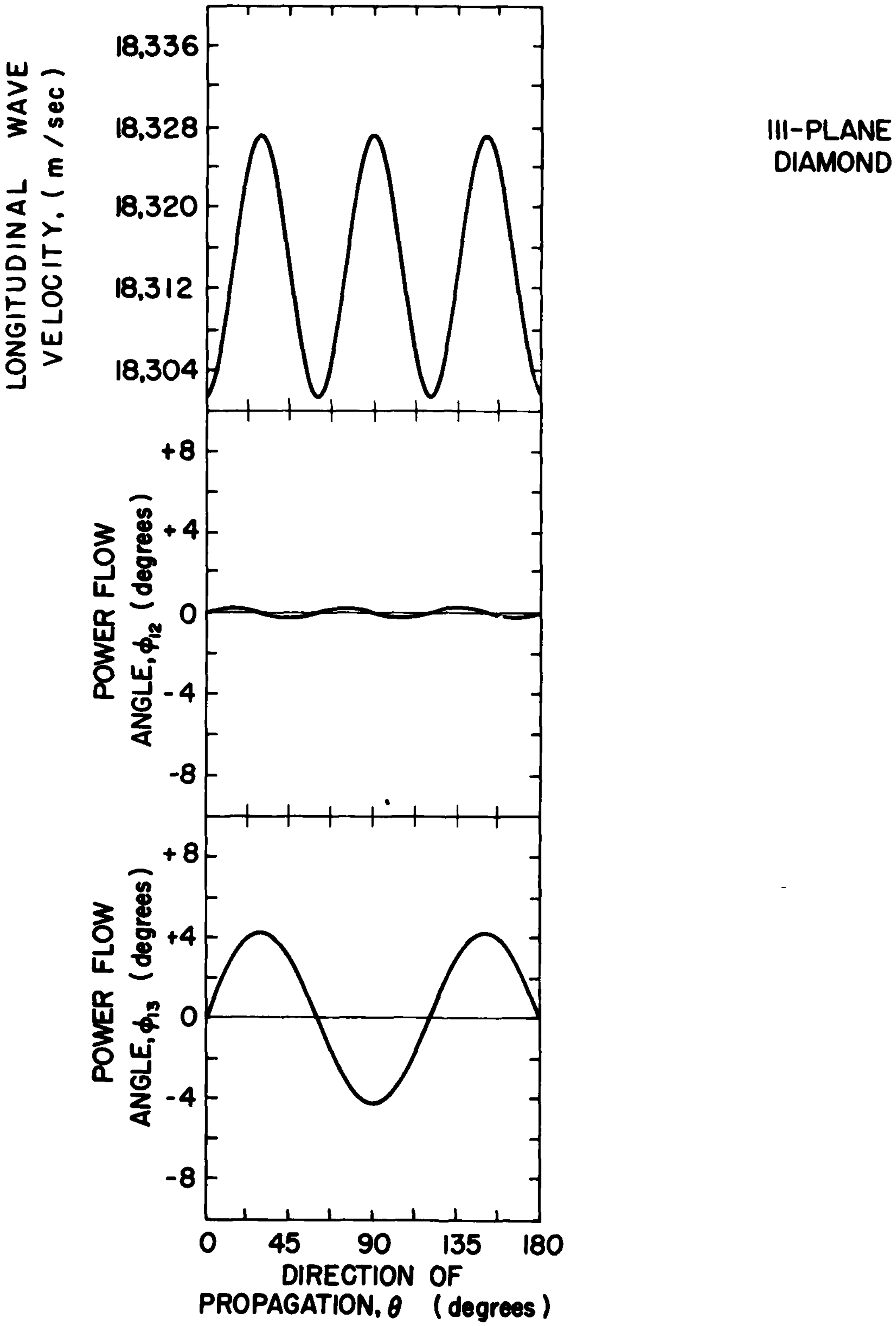

X-PLANE AND Y-PLANE
CdS
SECOND SHEAR WAVE VELOCITY, (m/sec)
2150.0
2050.0
1950.0
1850.0
1750.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
3.60
2.80
2.00
1.20
0.40
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

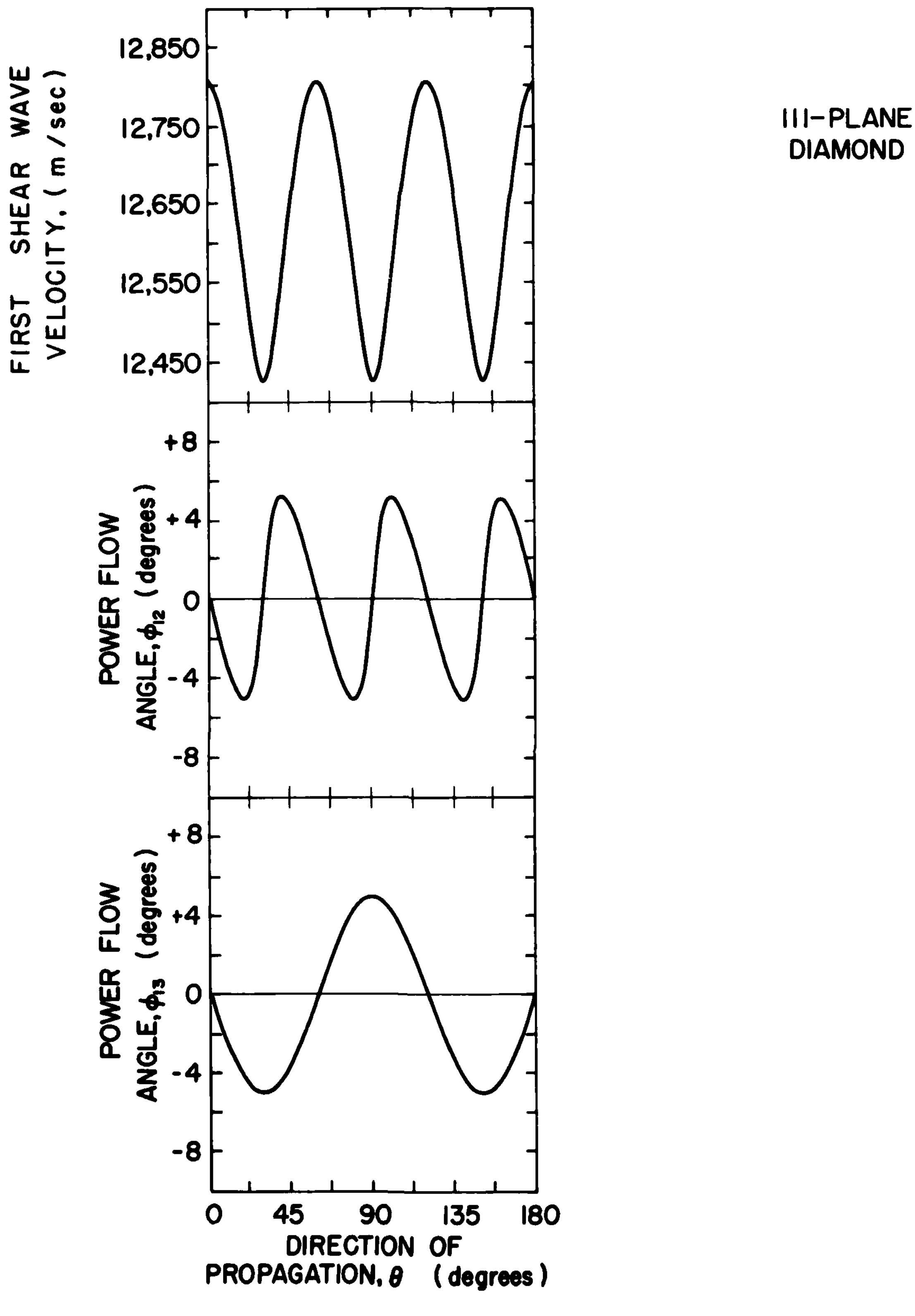


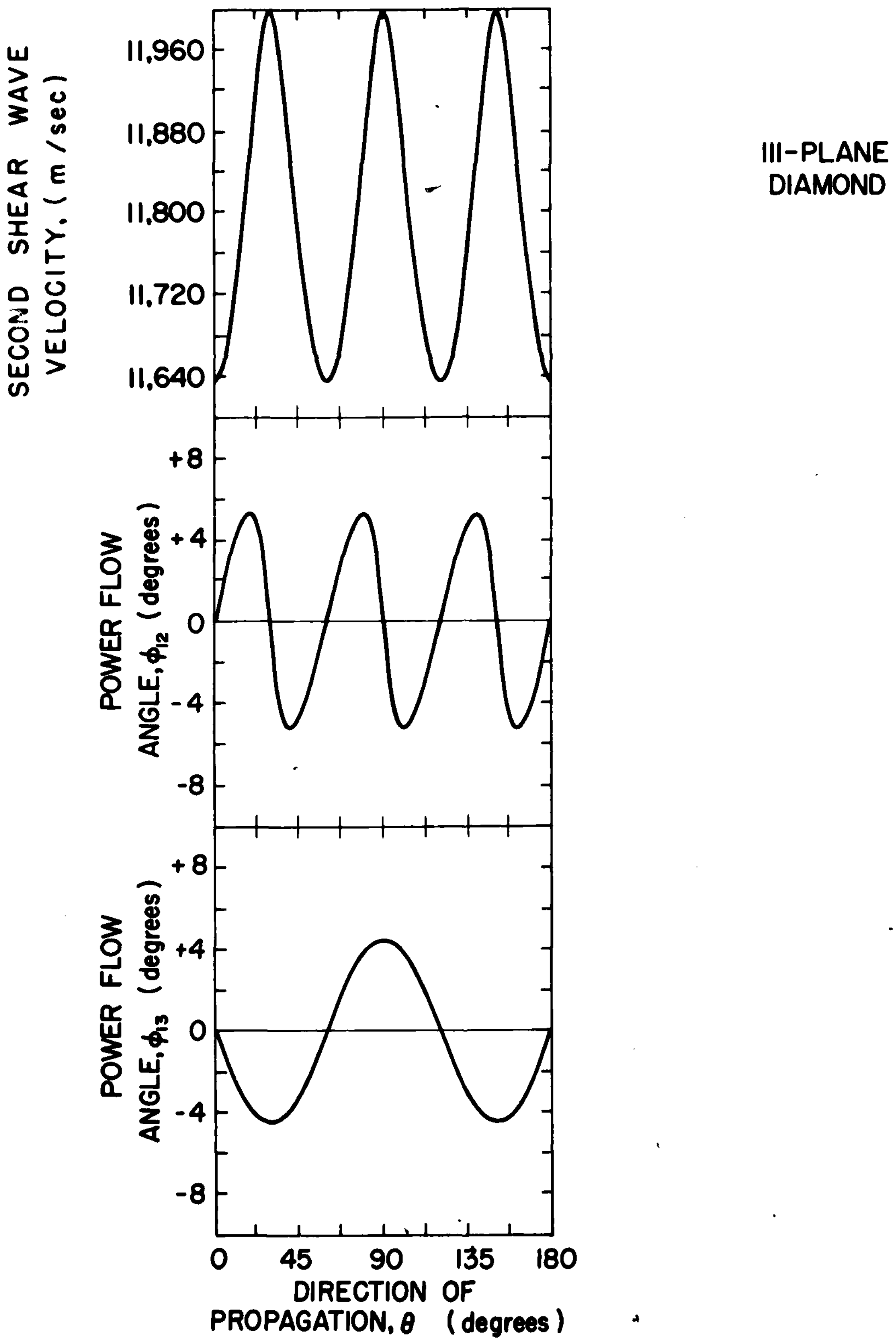
Z-PLANE
DIAMOND

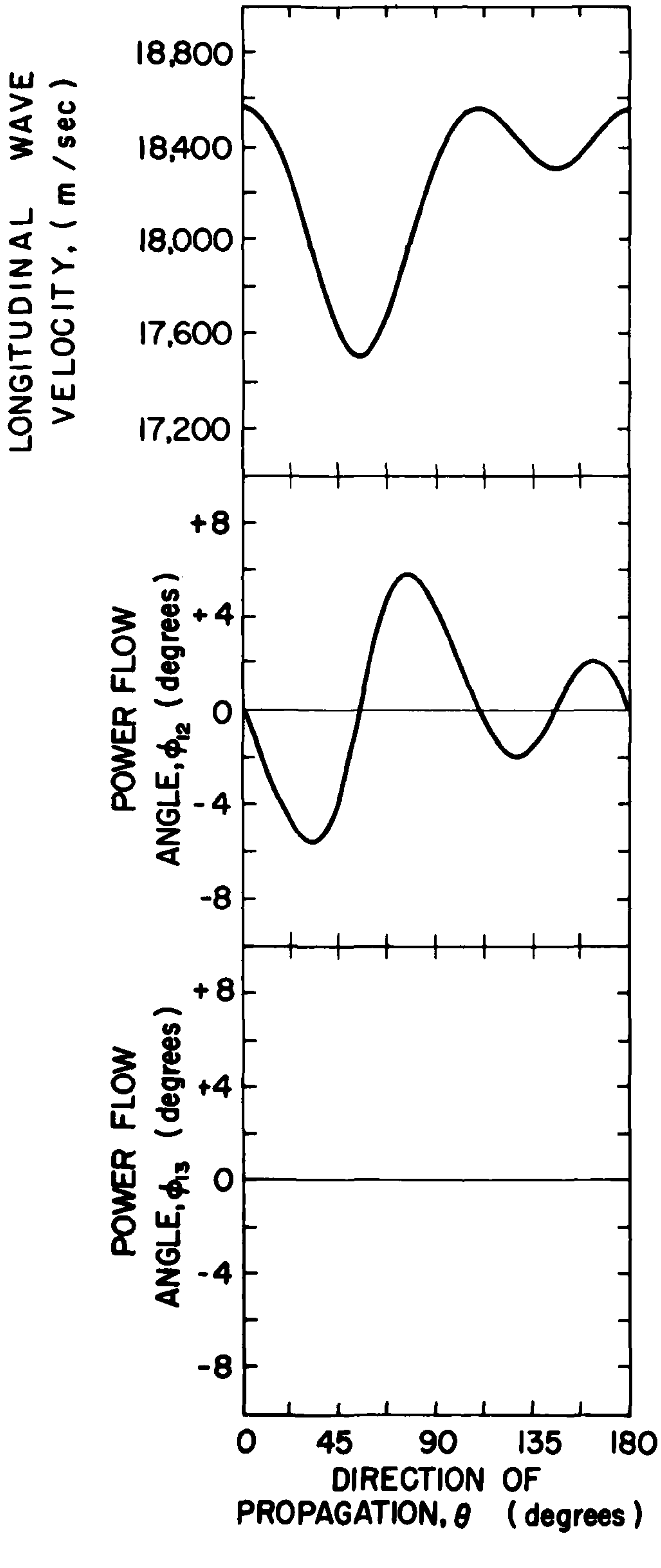


SECOND SHEAR WAVE VELOCITY, (m /sec)
12,800
12,400
12,000
11,600
11,200
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
DIAMOND

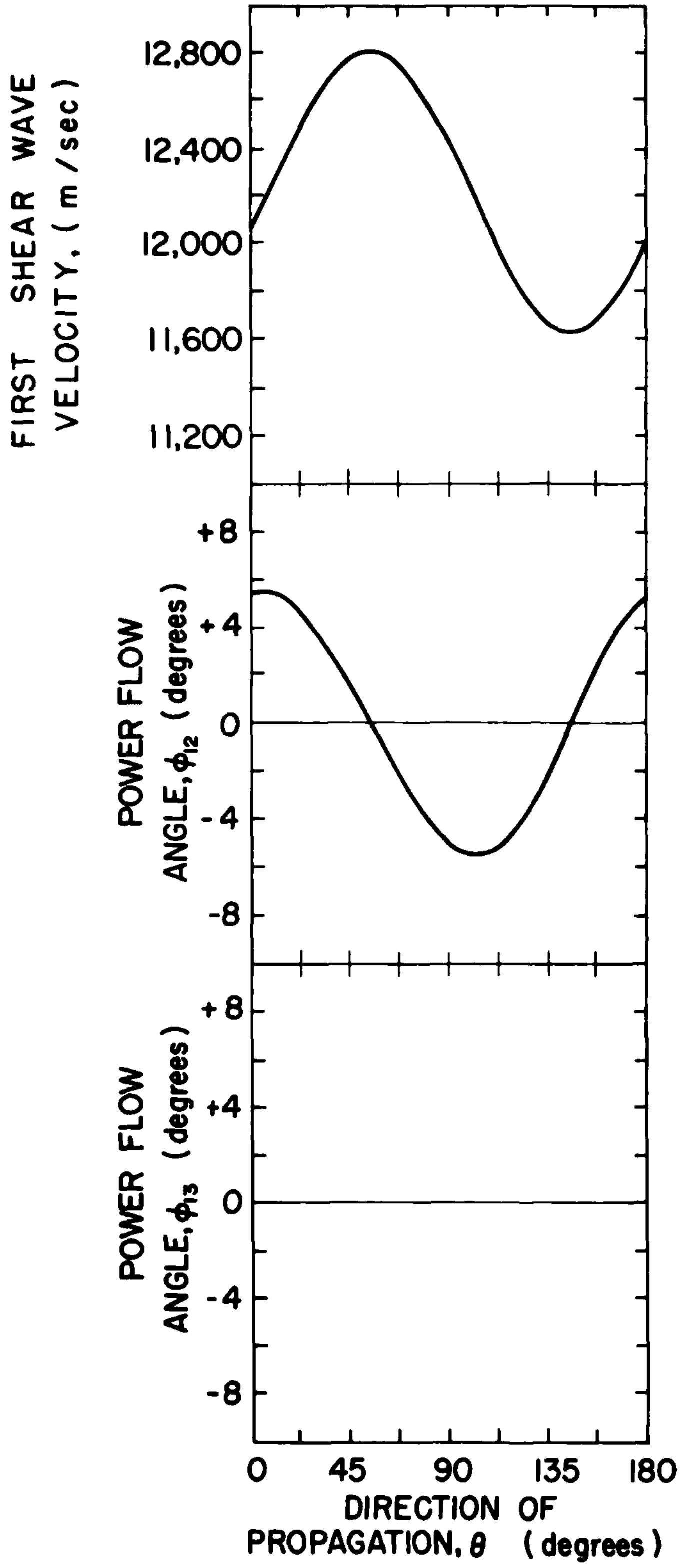

LONGITUDINAL WAVE VELOCITY, (m / sec)
18,336
18,328
18,320
18,312
18,304
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
III-PLANE
DIAMOND


FIRST SHEAR WAVE VELOCITY, (m/sec)
12,850
12,750
12,650
12,550
12,450
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
DIAMOND

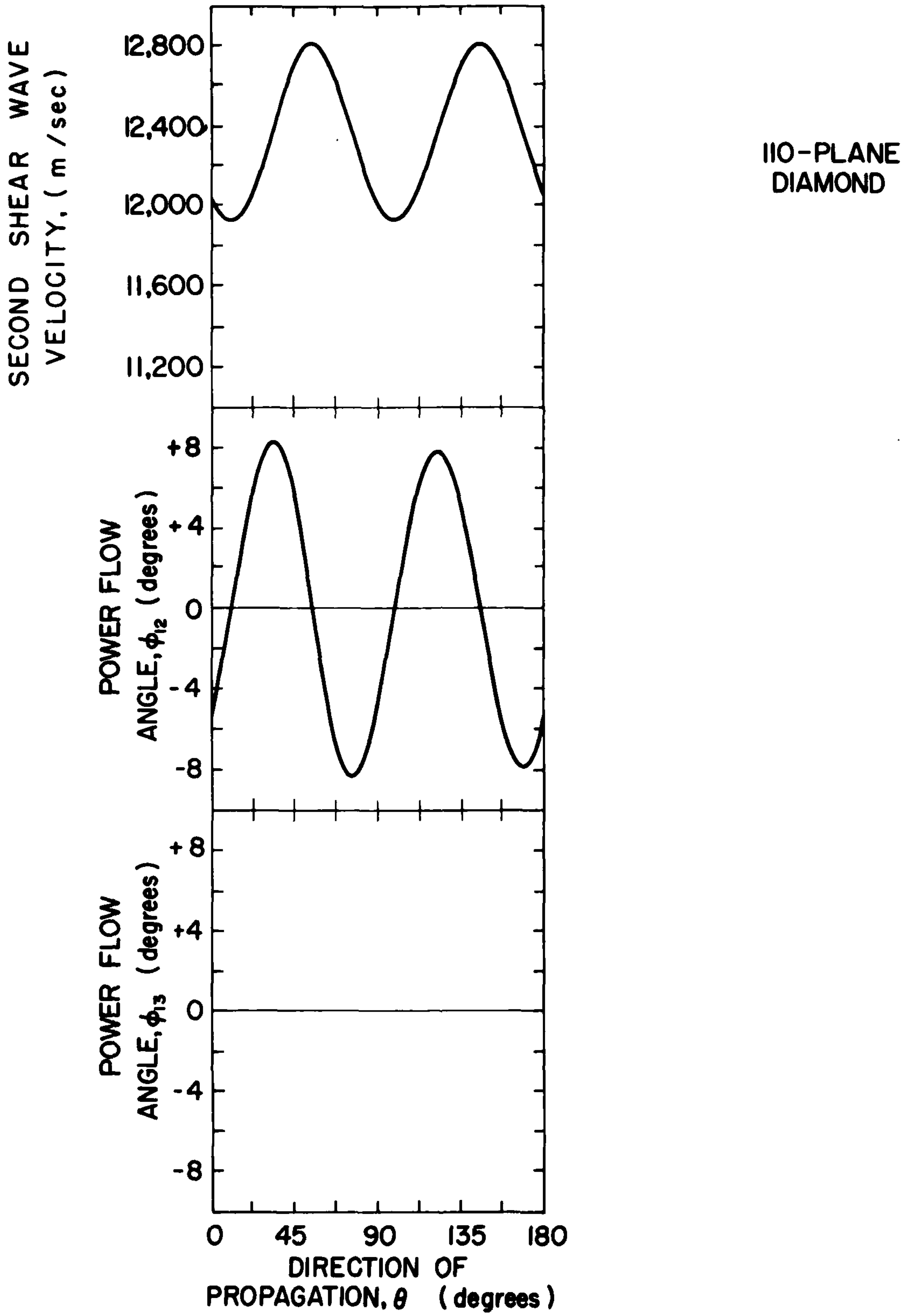

III-PLANE
DIAMOND
SECOND SHEAR WAVE VELOCITY, (m /sec)
11,960
11,880
11,800
11,720
11,640
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

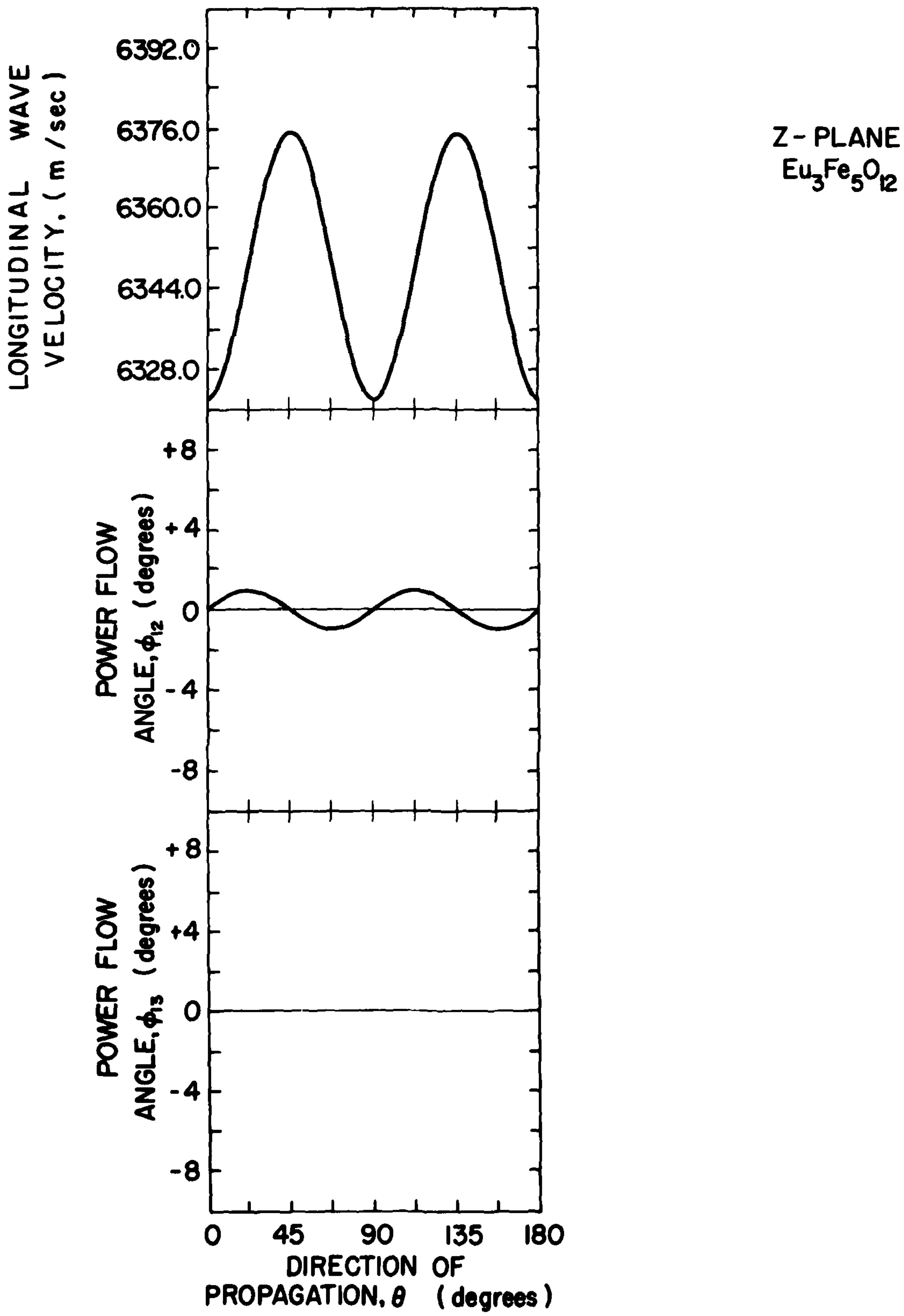


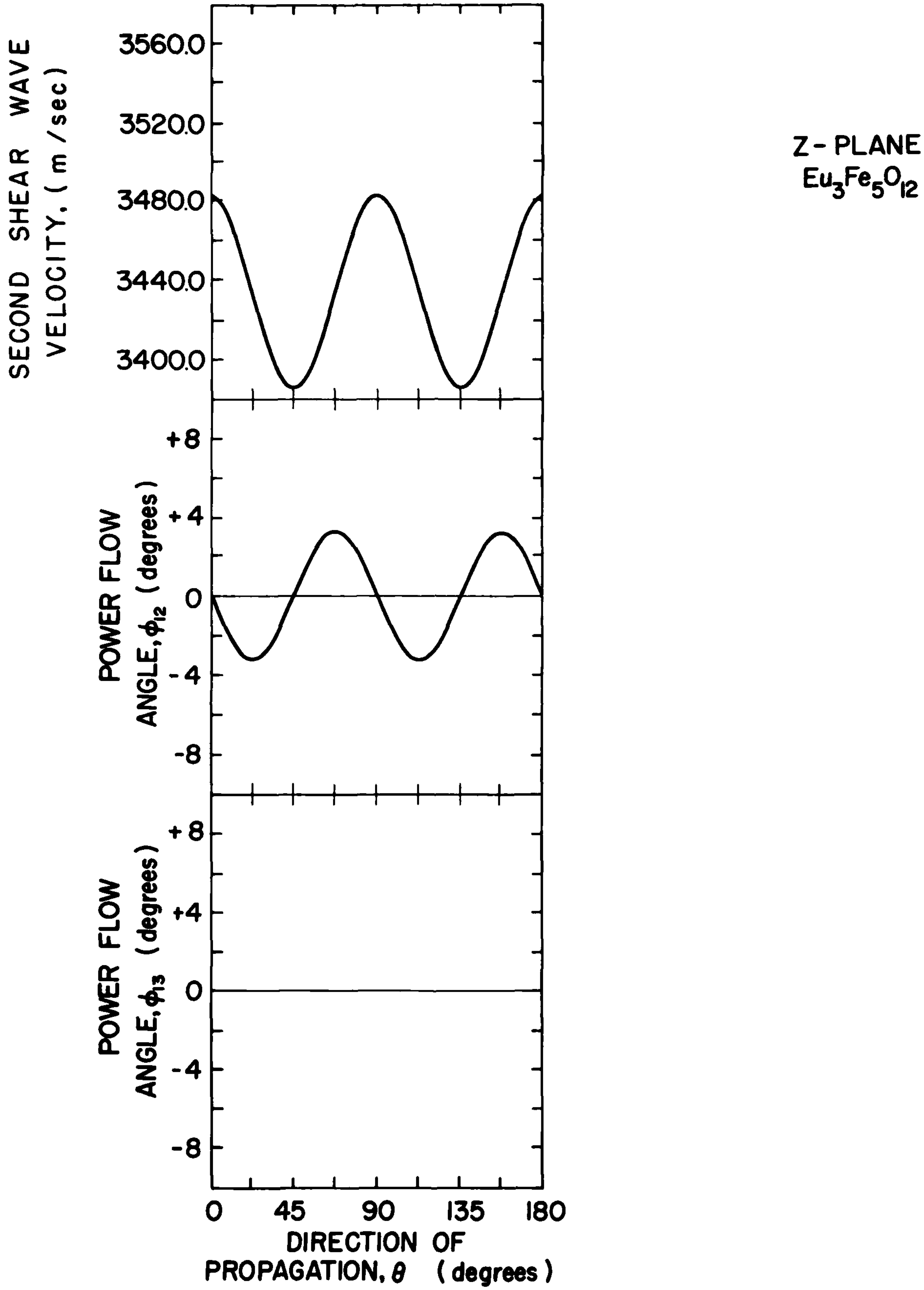
110-PLANE
DIAMOND



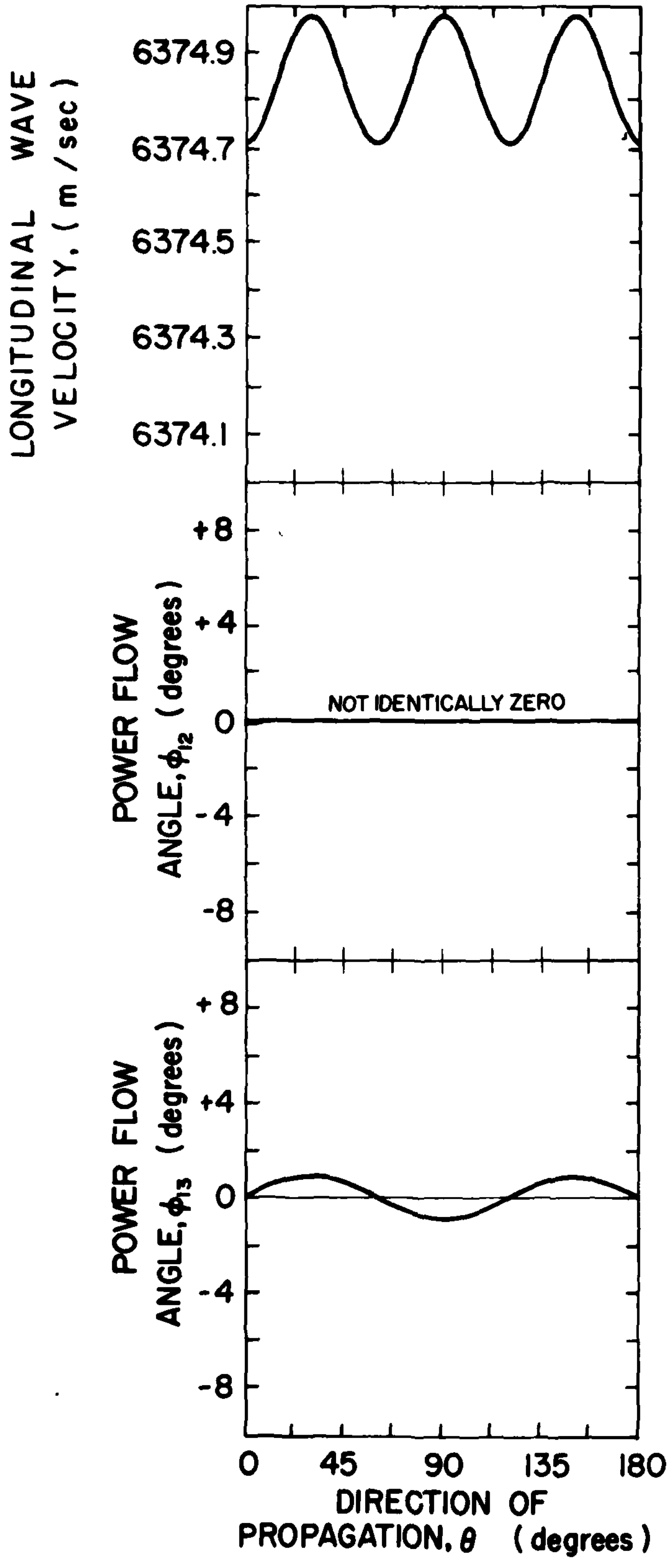
110-PLANE
DIAMOND


SECOND SHEAR WAVE VELOCITY, (m/sec)
12,800
12,400
12,000
11,600
11,200
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE DIAMOND

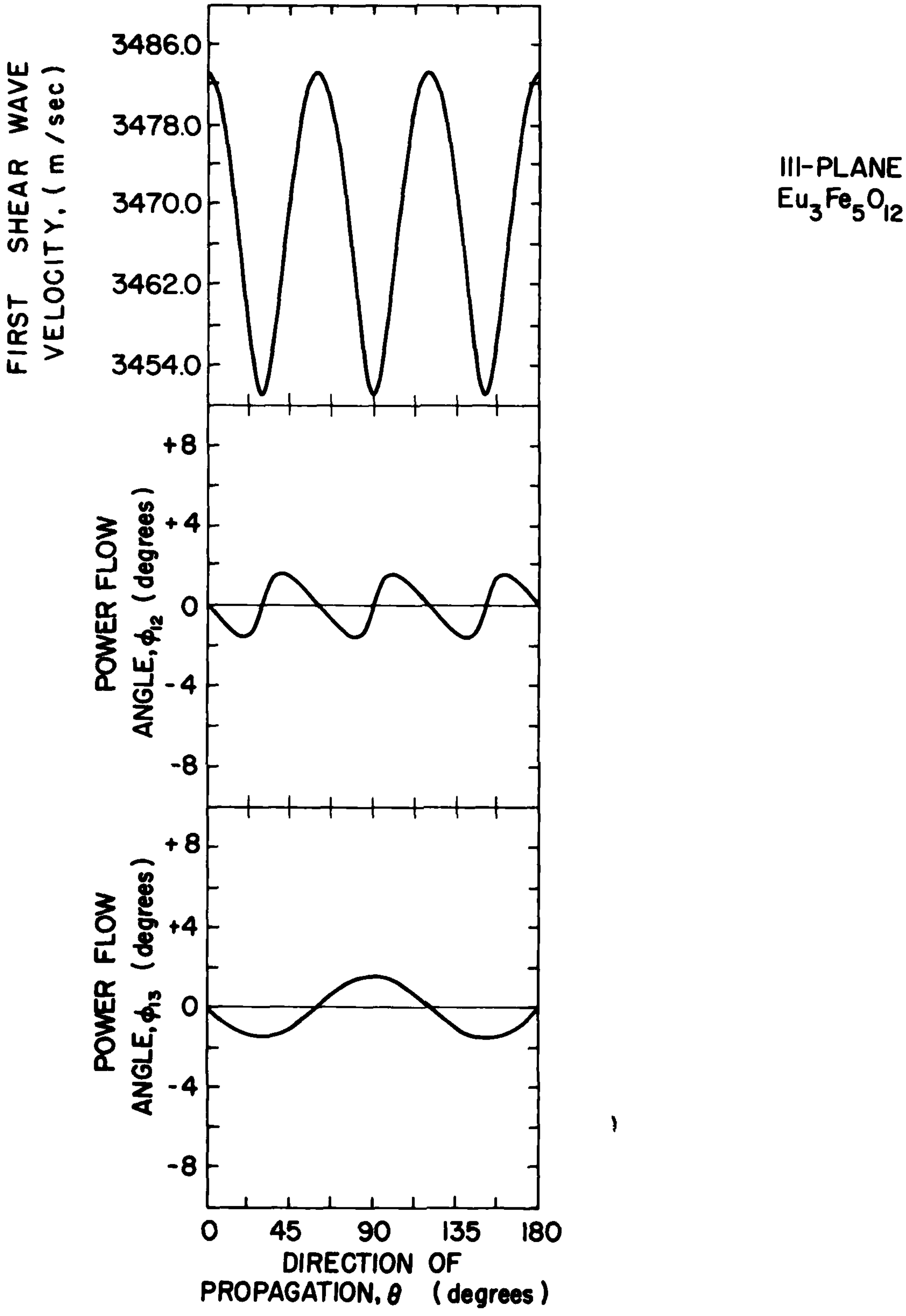

LONGITUDINAL WAVE VELOCITY, (m/sec)
6392.0
6376.0
6360.0
6344.0
6328.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
$Eu_3Fe_5O_{12}$



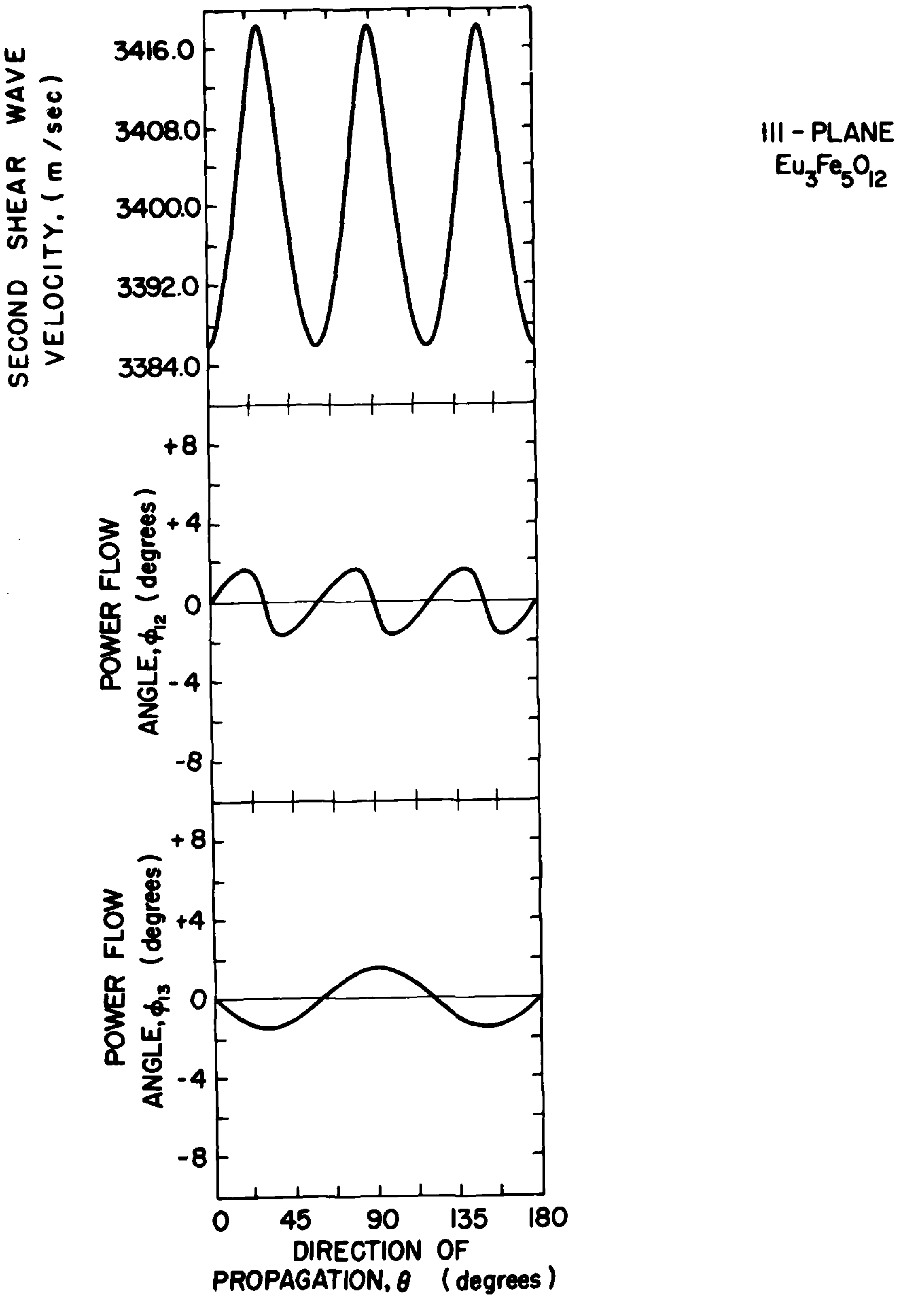
SECOND SHEAR WAVE VELOCITY, (m /sec)
3560.0
3520.0
3480.0
3440.0
3400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z - PLANE
$Eu_3Fe_5O_{12}$



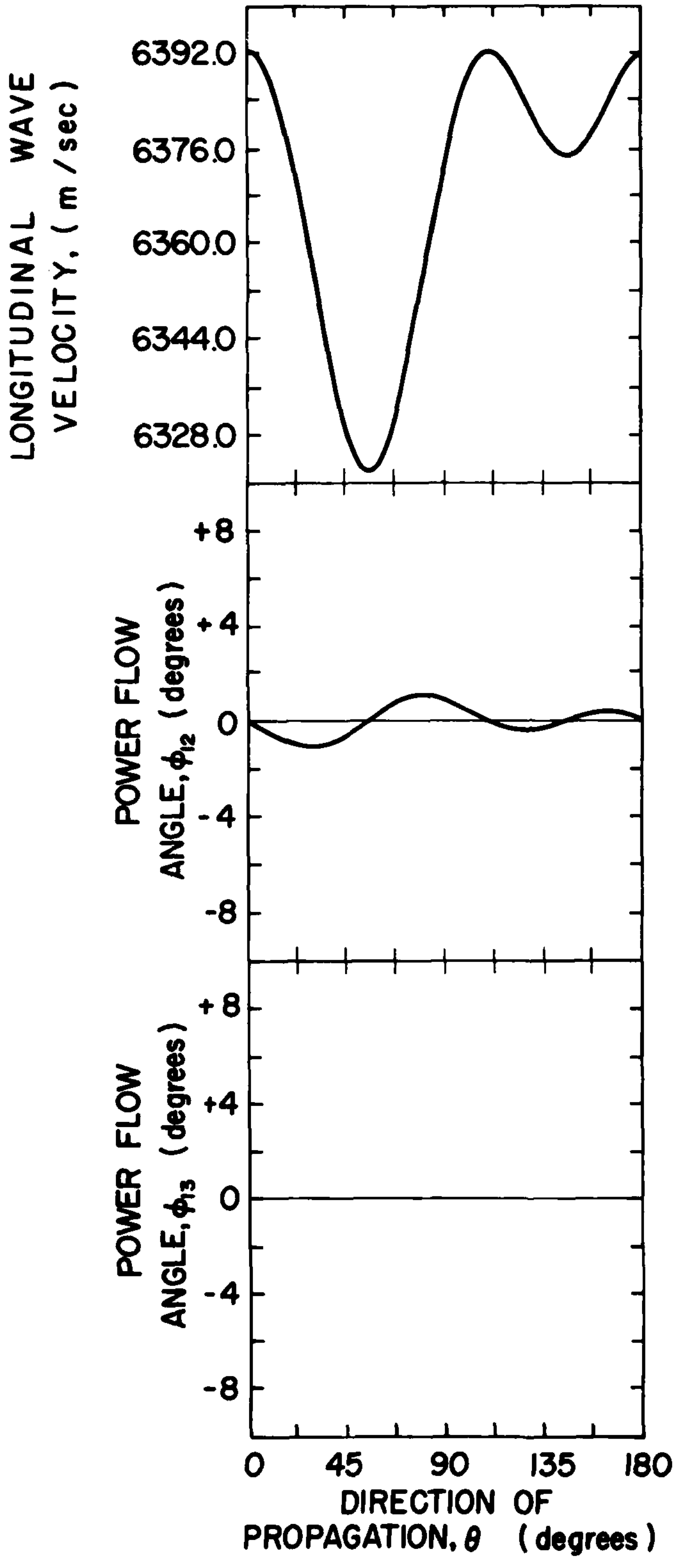
III-PLANE
$Eu_3Fe_5O_{12}$



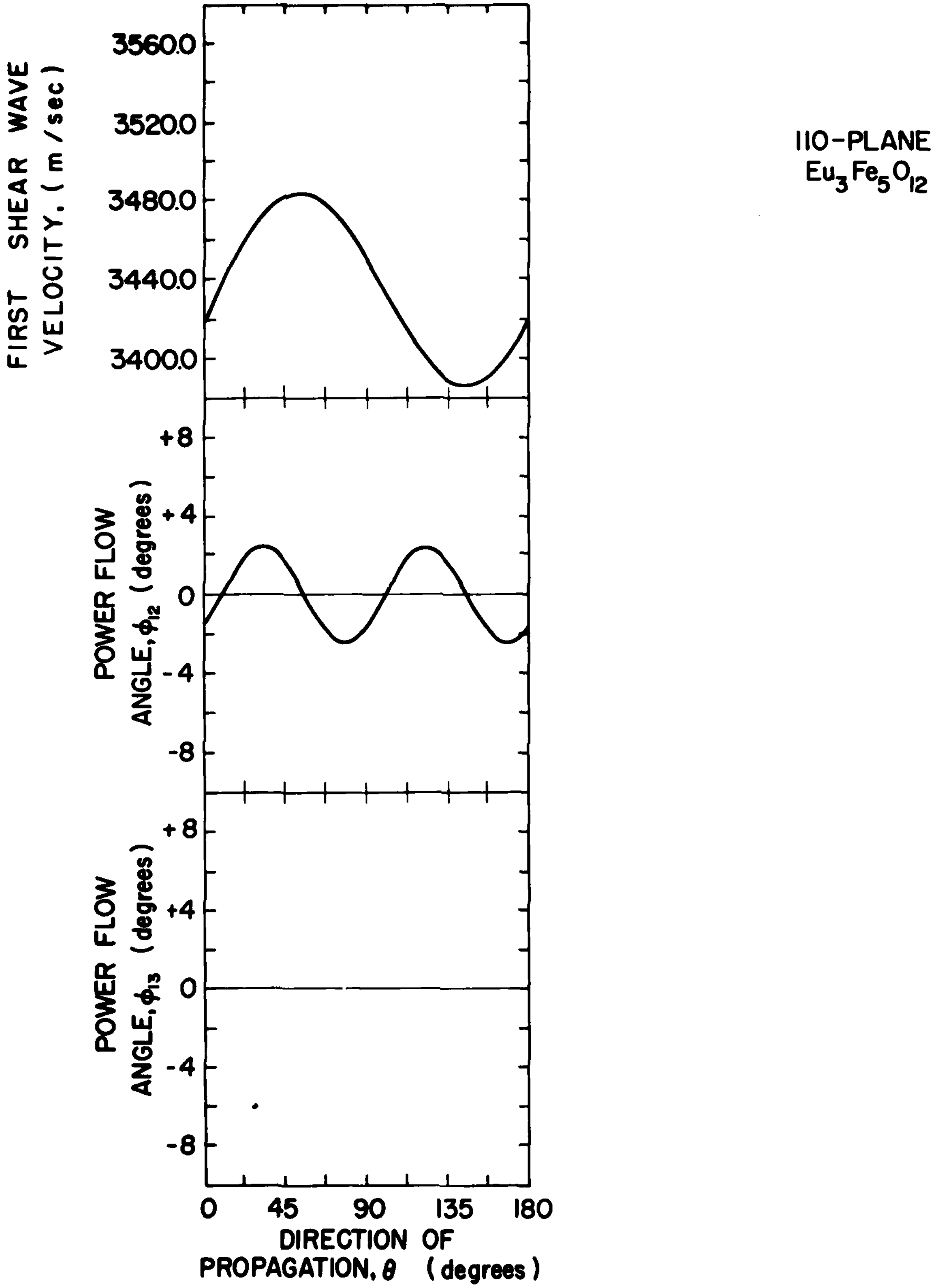
FIRST SHEAR WAVE VELOCITY, (m/sec)
3486.0
3478.0
3470.0
3462.0
3454.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
III-PLANE
$Eu_3Fe_5O_{12}$



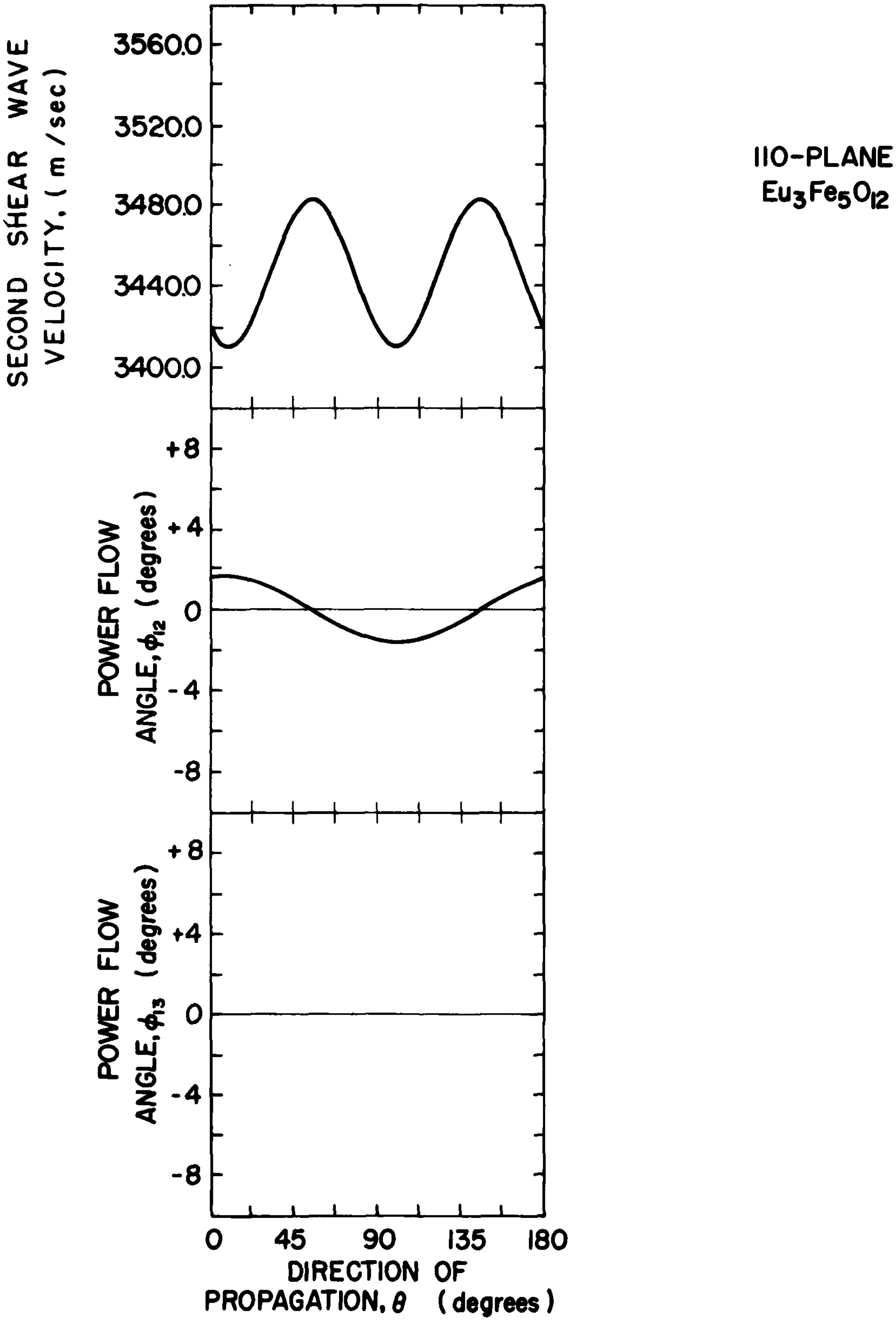
SECOND SHEAR WAVE VELOCITY, (m/sec)
3416.0
3408.0
3400.0
3392.0
3384.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111 - PLANE
$Eu_3Fe_5O_{12}$

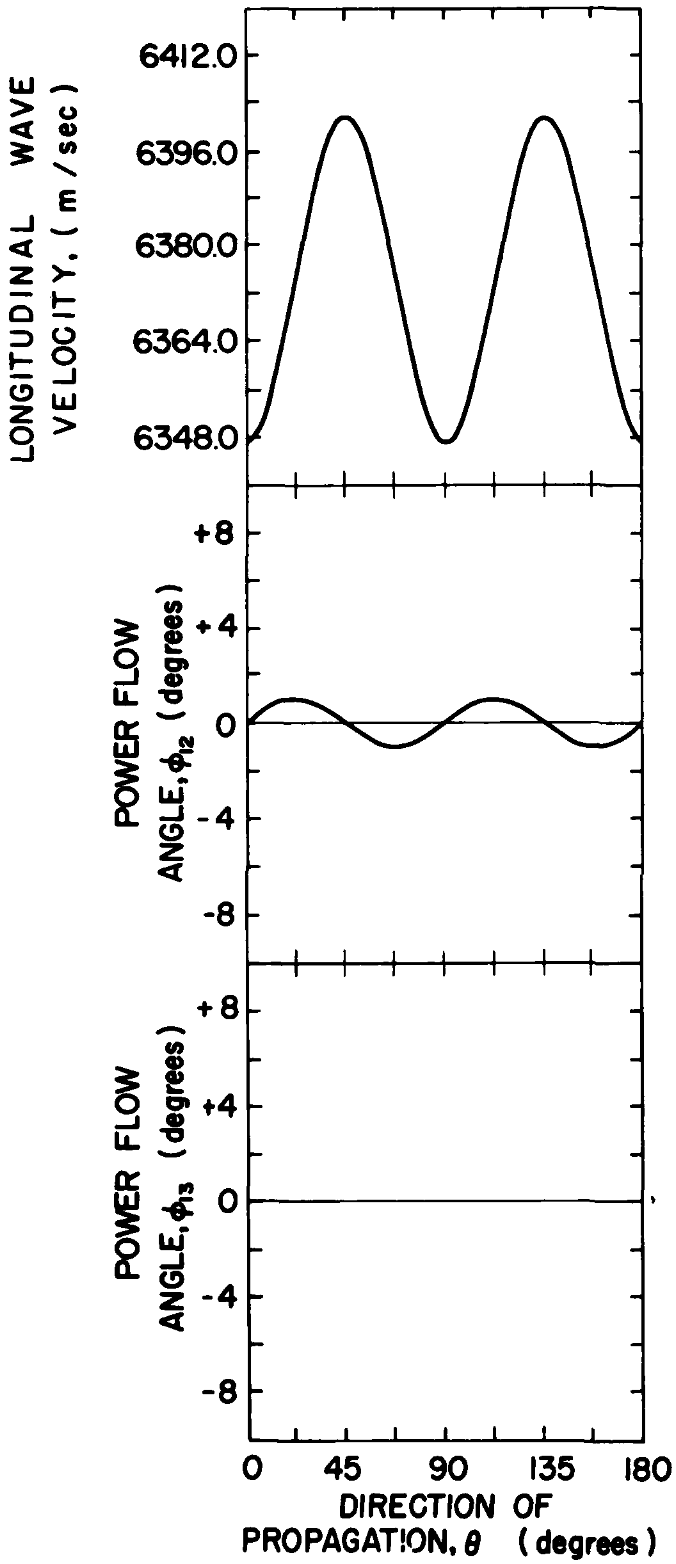


110 - PLANE
$Eu_3Fe_5O_{12}$

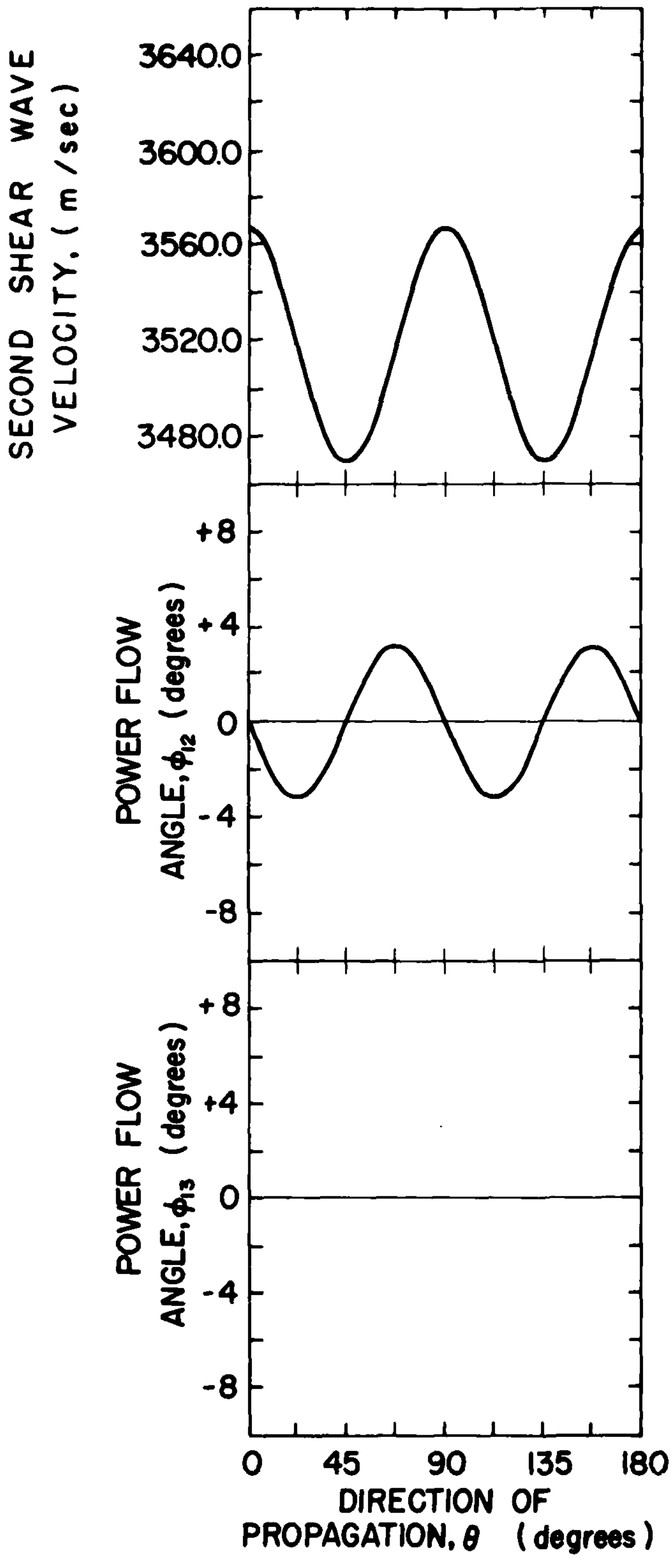


FIRST SHEAR WAVE VELOCITY, (m /sec)
3560.0
3520.0
3480.0
3440.0
3400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE
$Eu_3Fe_5O_{12}$

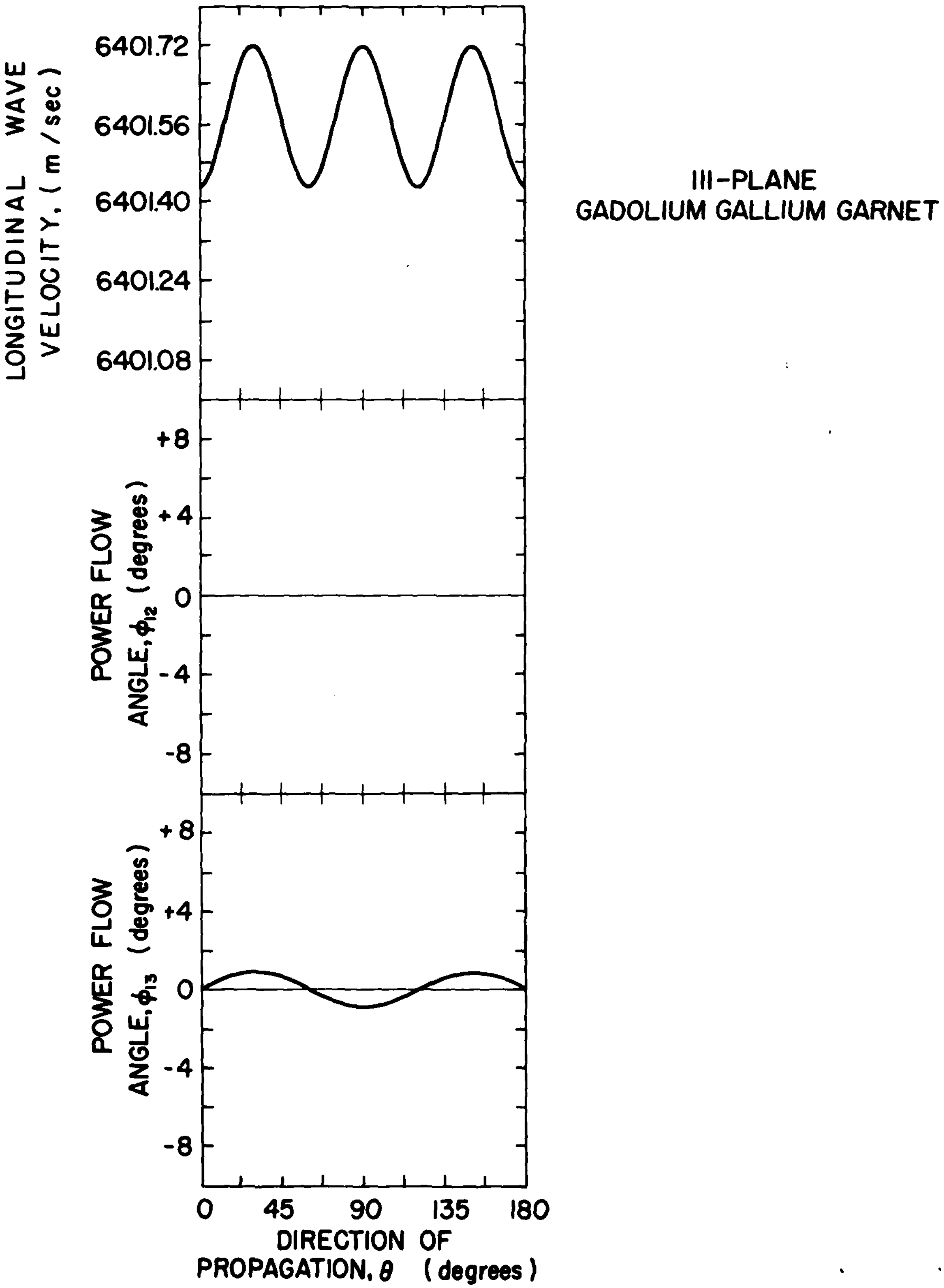

SECOND SHEAR WAVE VELOCITY, (m /sec)
3560.0
3520.0
3480.0
3440.0
3400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE
$Eu_3Fe_5O_{12}$

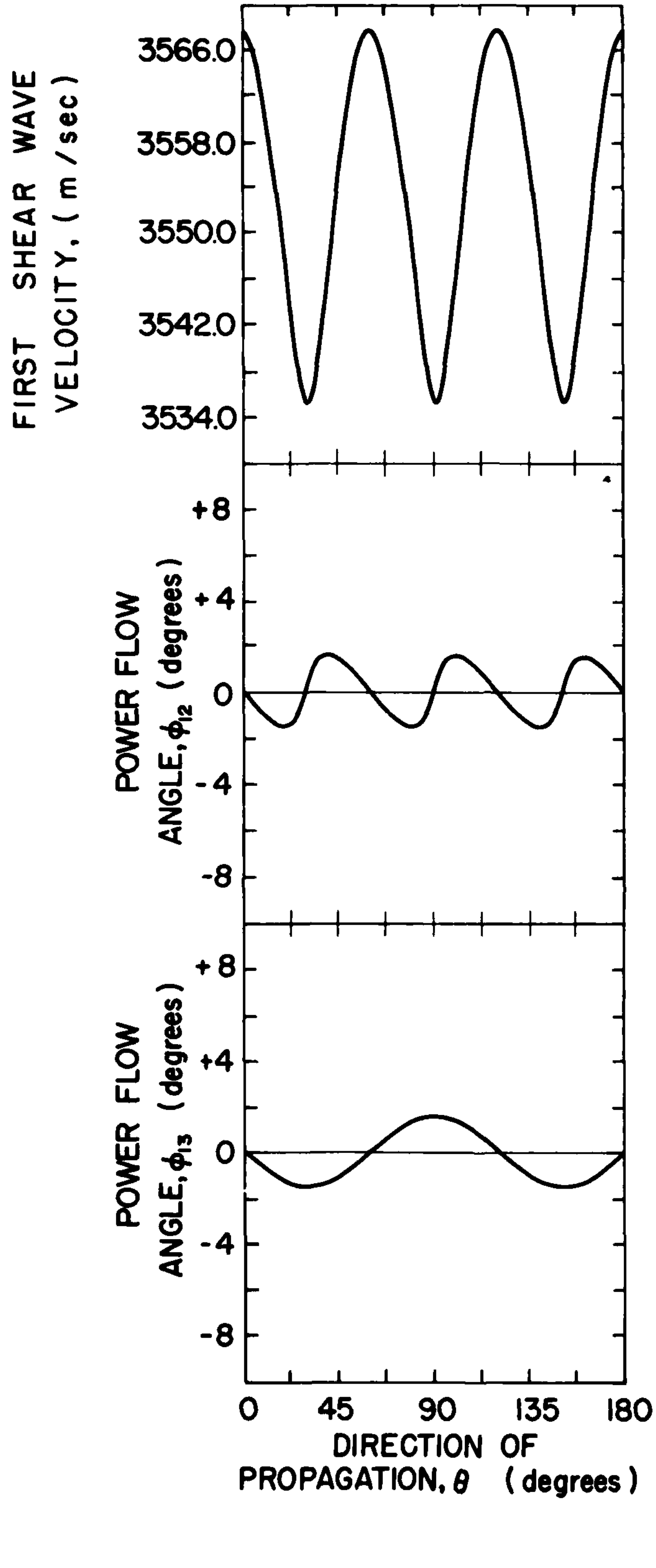


Z-PLANE
GADOLINIUM GALLIUM GARNET

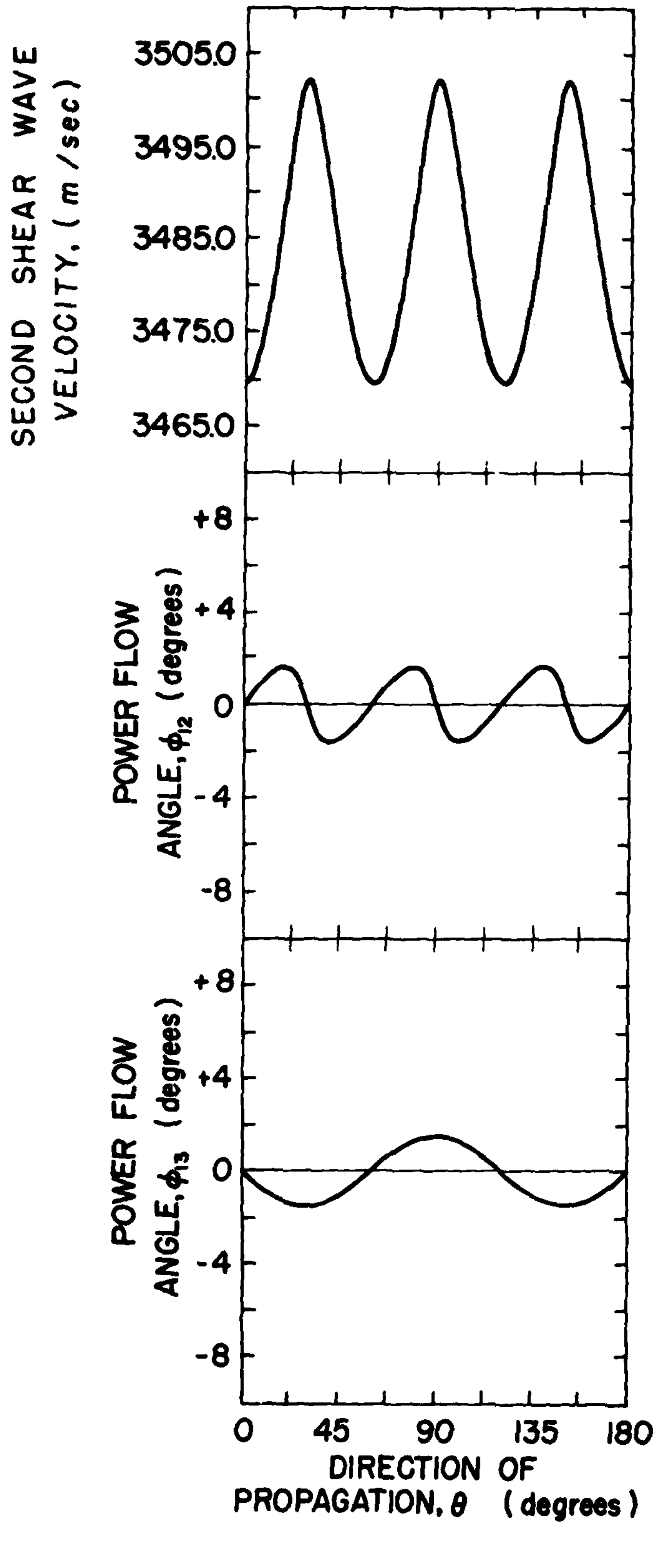


Z-PLANE
GADOLINIUM GALLIUM GARNET

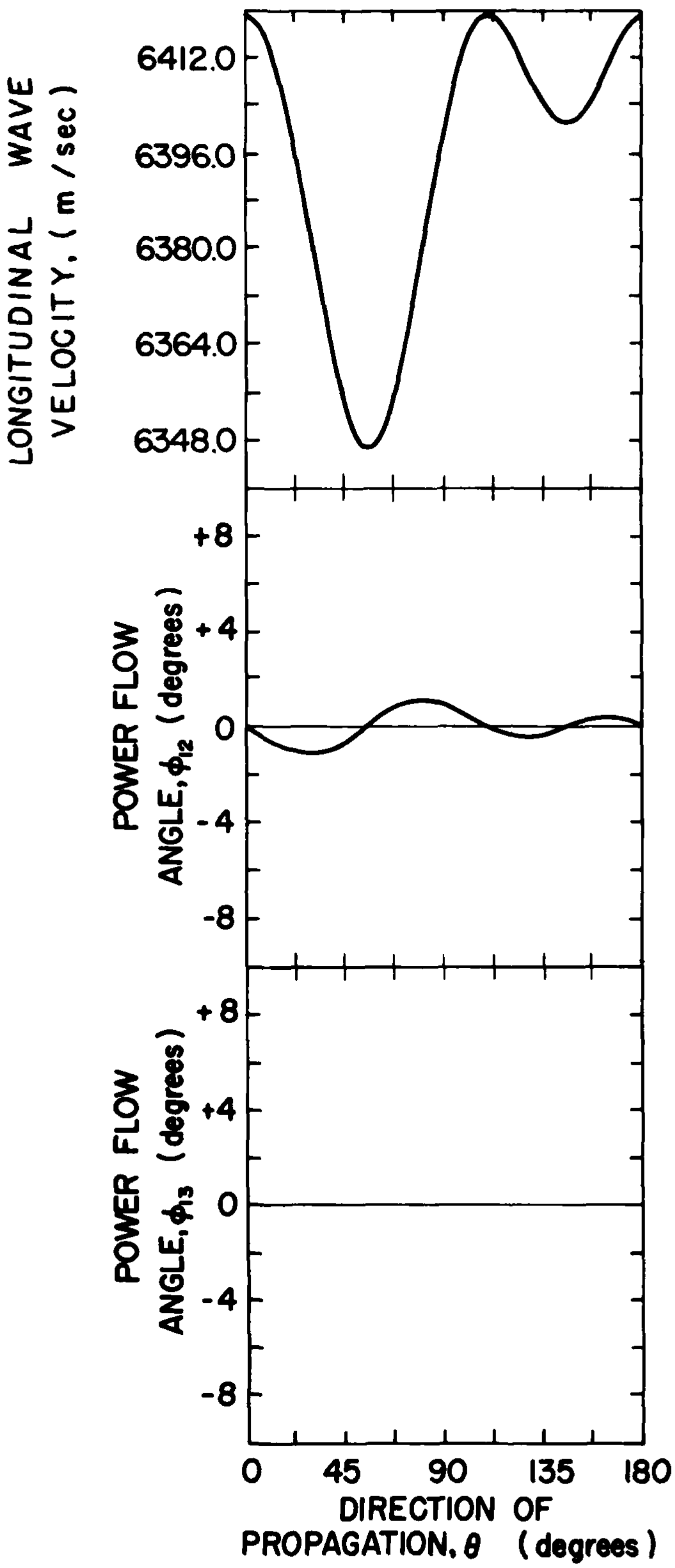

LONGITUDINAL WAVE VELOCITY, (m/sec)
6401.72
6401.56
6401.40
6401.24
6401.08
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
GADOLIUM GALLIUM GARNET



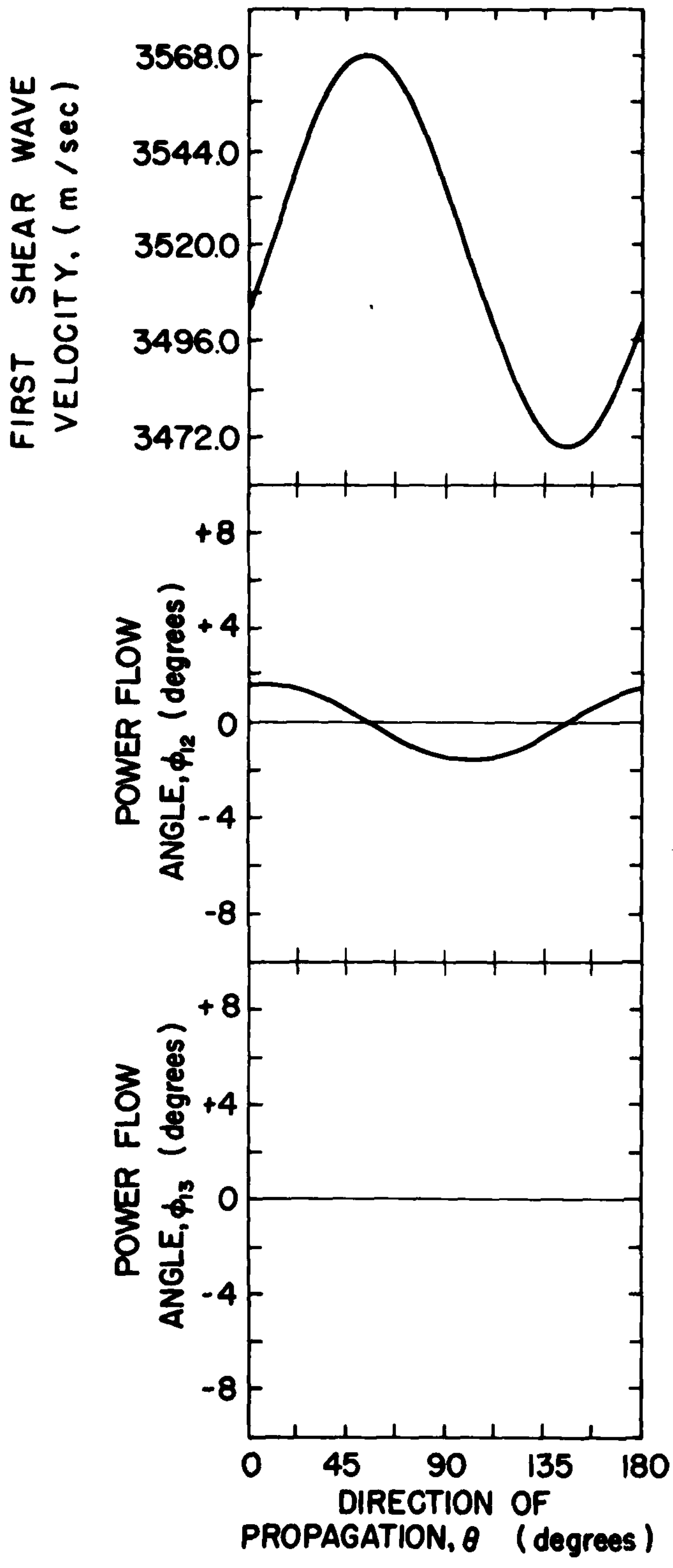
111-PLANE
GADOLINIUM GALLIUM GARNET



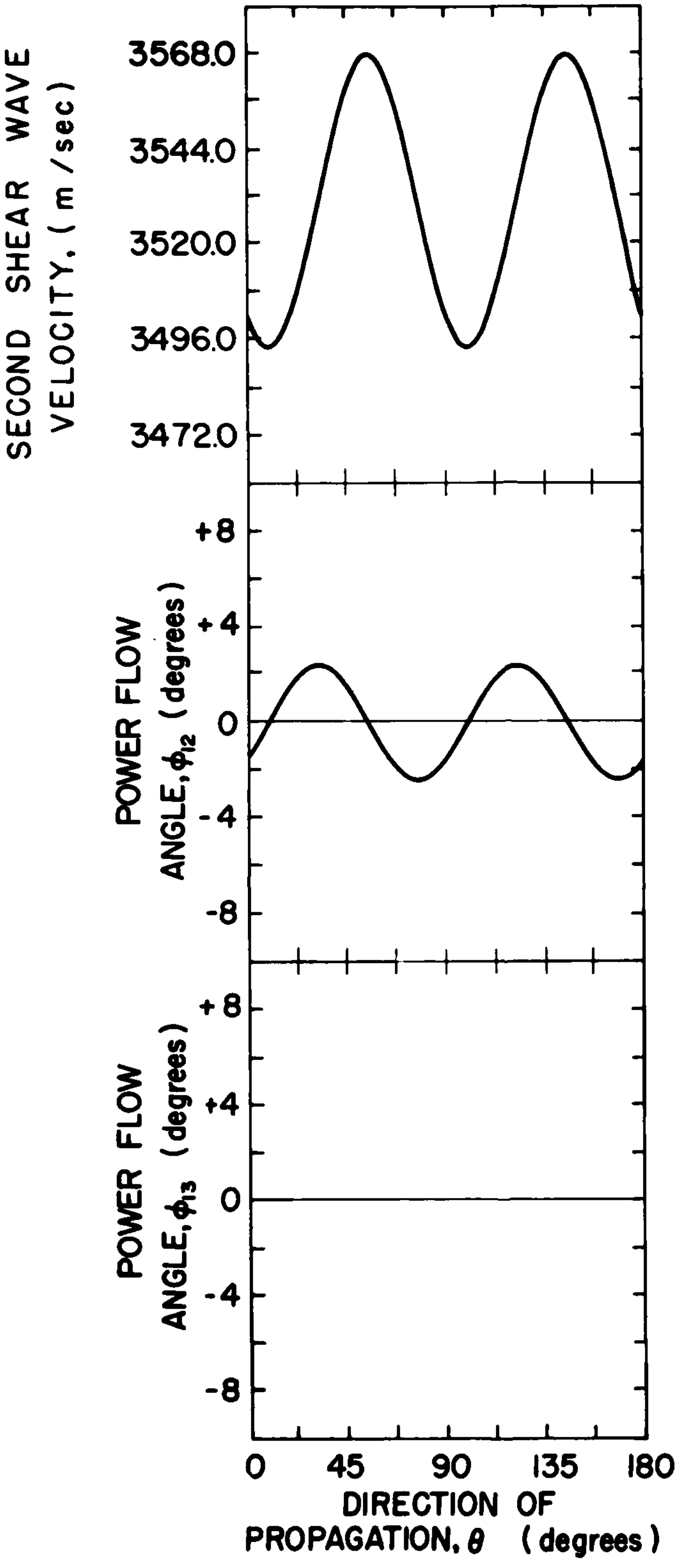
111-PLANE
GADOLINIUM GALLIUM GARNET



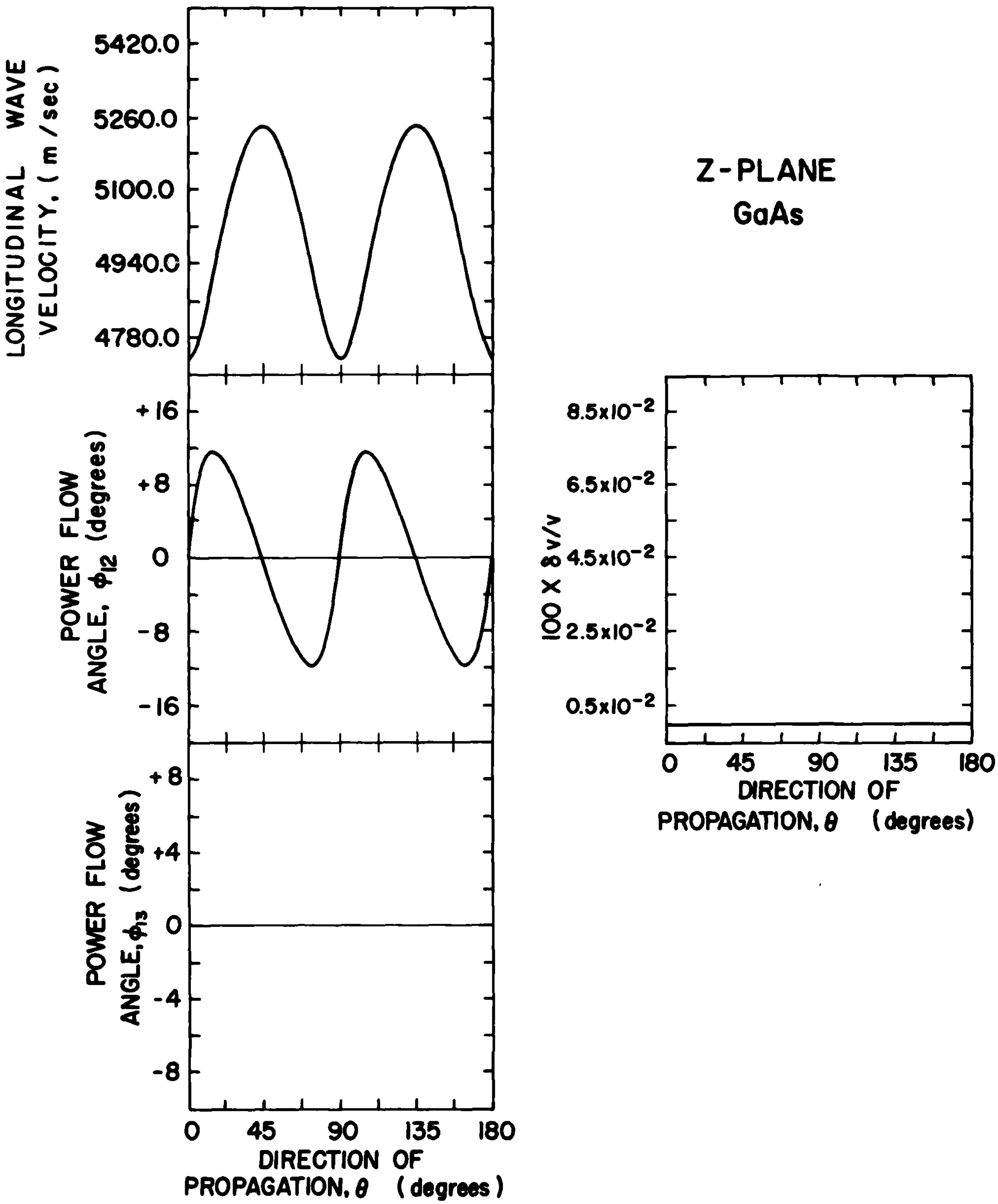
110-PLANE
GADOLINIUM GALLIUM GARNET

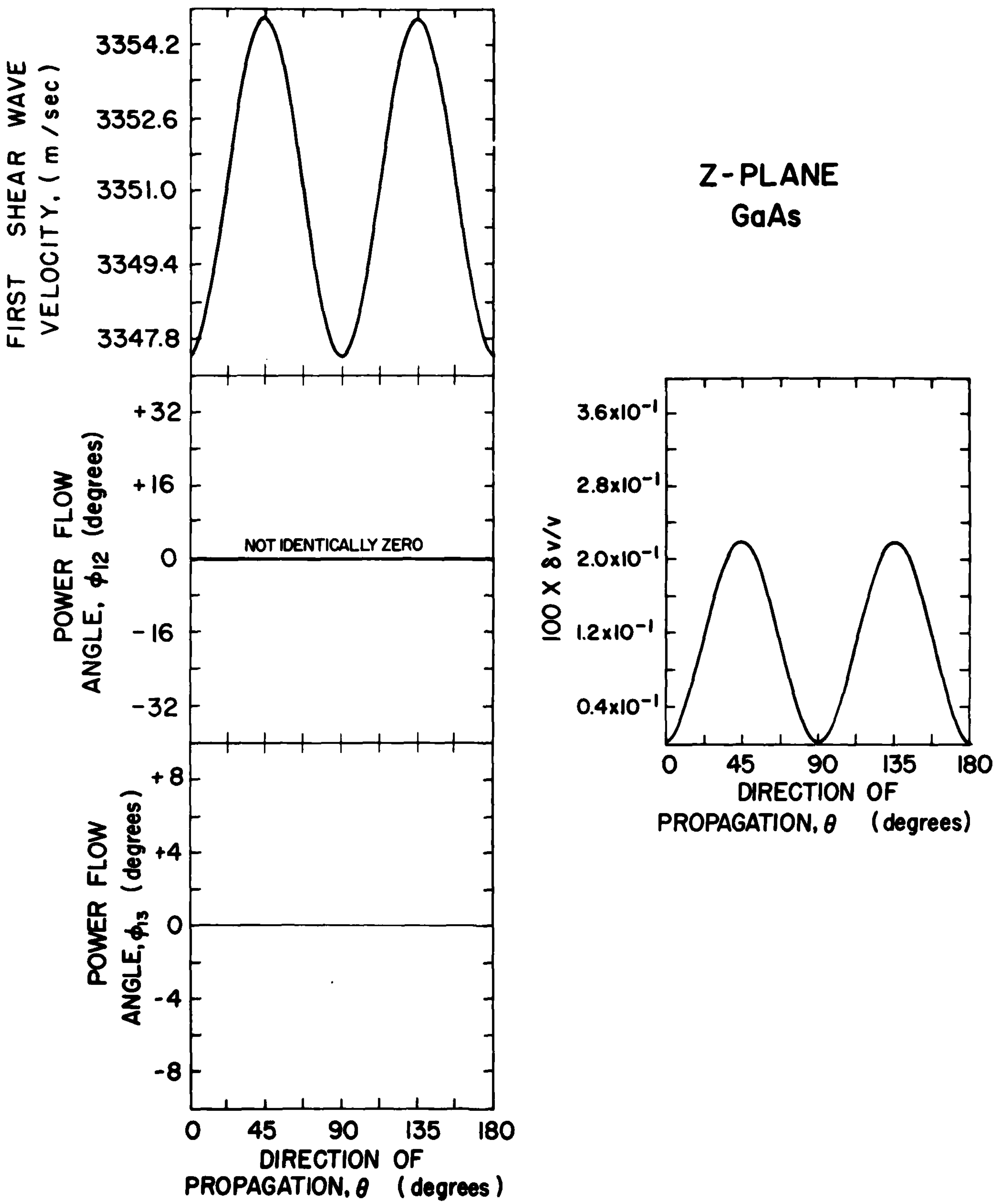


110-PLANE
GADOLINIUM GALLIUM GARNET

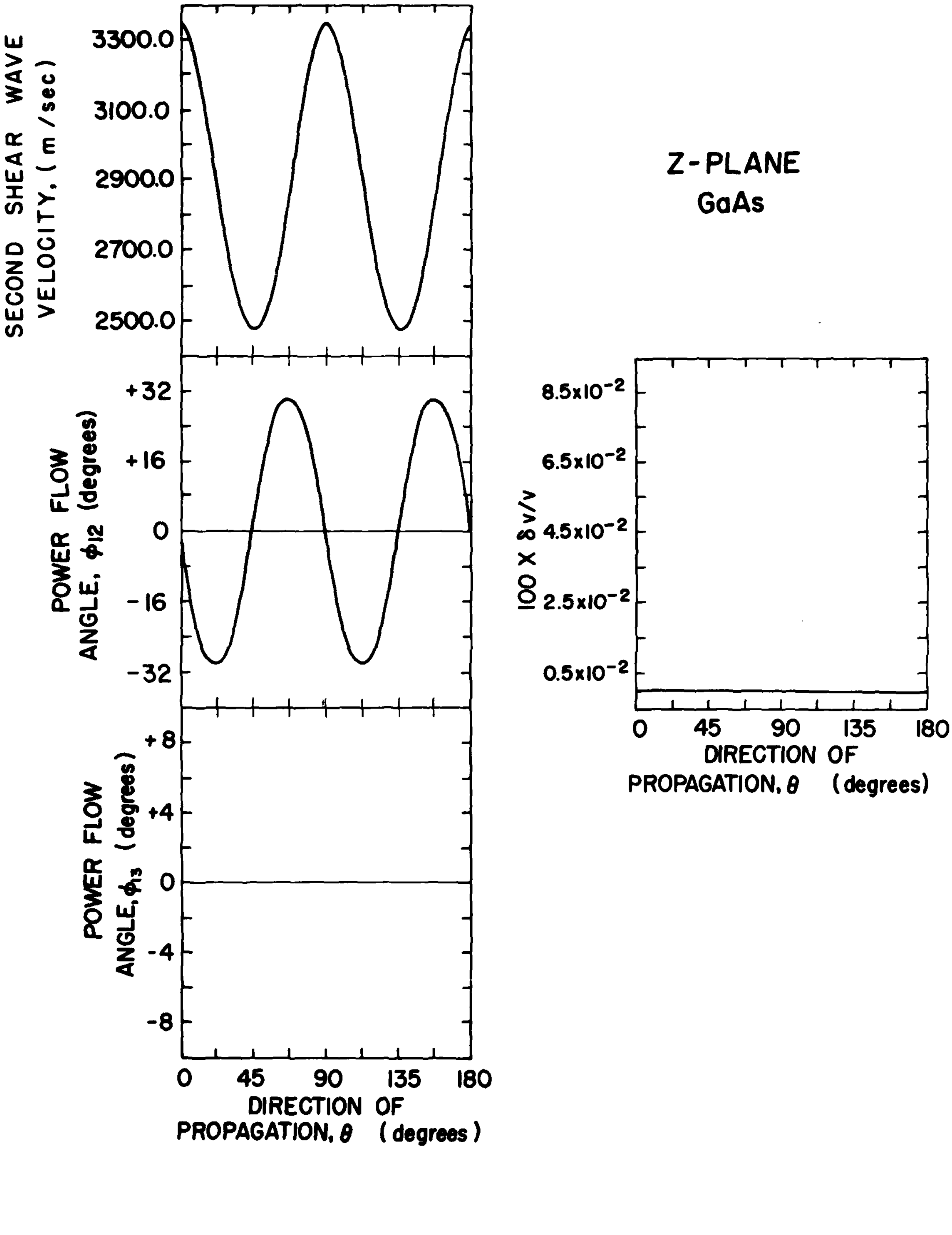


110-PLANE
GADOLINIUM GALLIUM GARNET

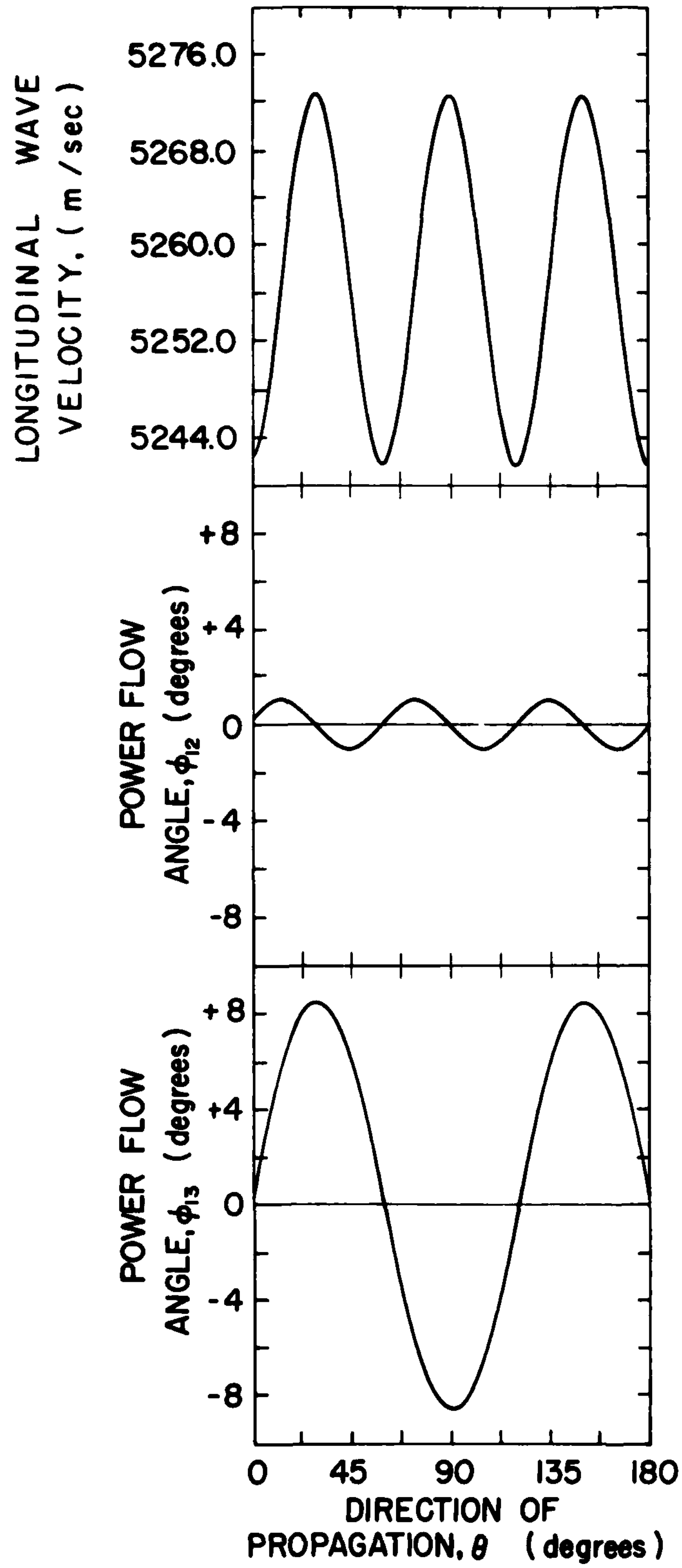

LONGITUDINAL WAVE VELOCITY, (m / sec)
5420.0
5260.0
5100.0
4940.0
4780.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
GaAs
$100 \times \delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



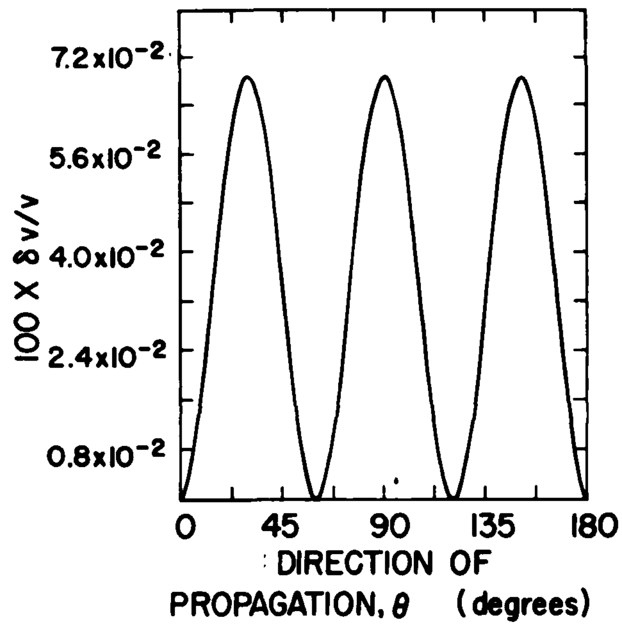
FIRST SHEAR WAVE VELOCITY, (m / sec)
3354.2
3352.6
3351.0
3349.4
3347.8
POWER FLOW ANGLE, ϕ_{12} (degrees)
+32
+16
0
-16
-32
NOT IDENTICALLY ZERO
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
GaAs
100 X $\delta v/v$
3.6x10^{-1}
2.8x10^{-1}
2.0x10^{-1}
1.2x10^{-1}
0.4x10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

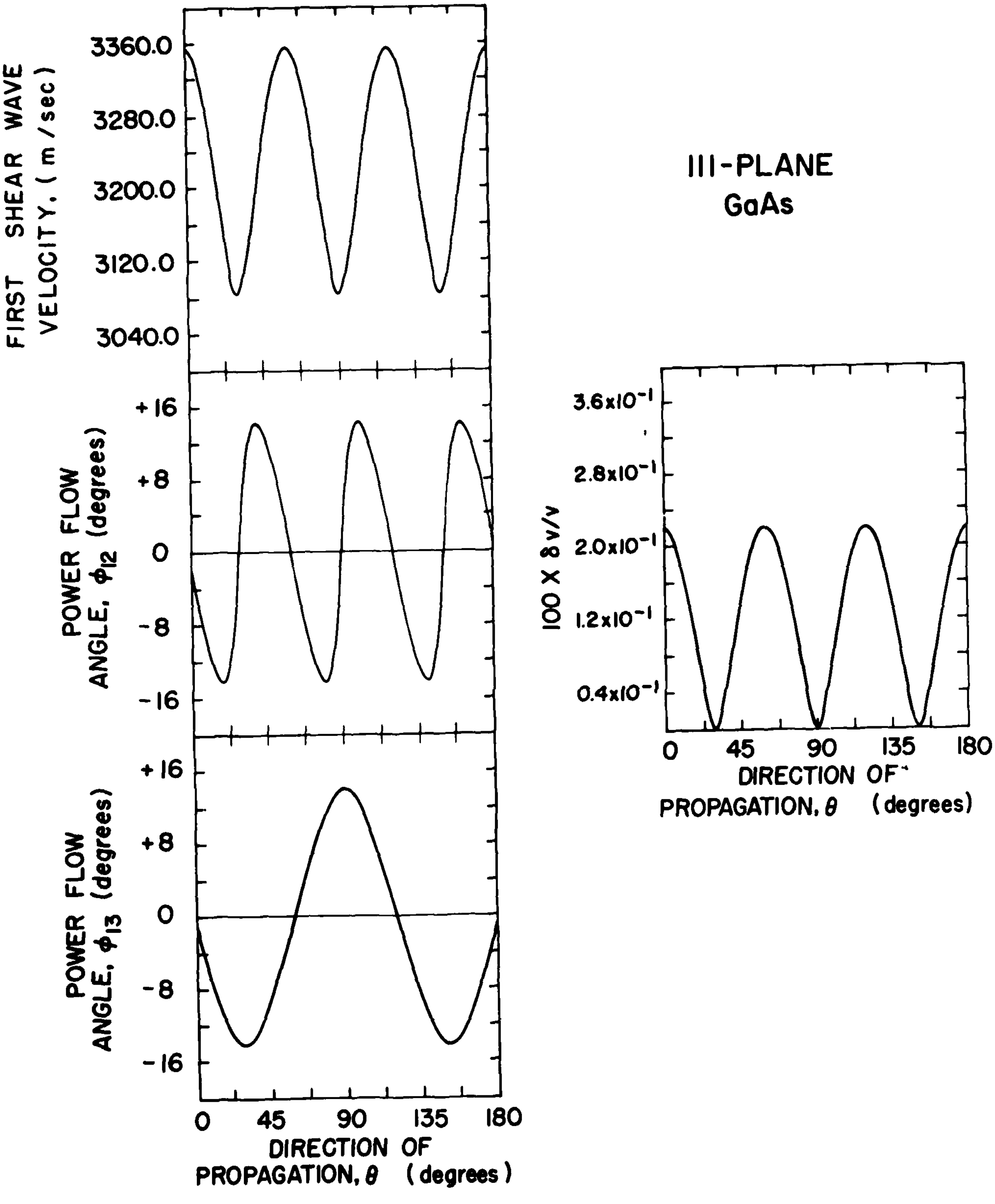


SECOND SHEAR WAVE VELOCITY, (m/sec)
3300.0
3100.0
2900.0
2700.0
2500.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+32
+16
0
-16
-32
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
GaAs
$100 \times \delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

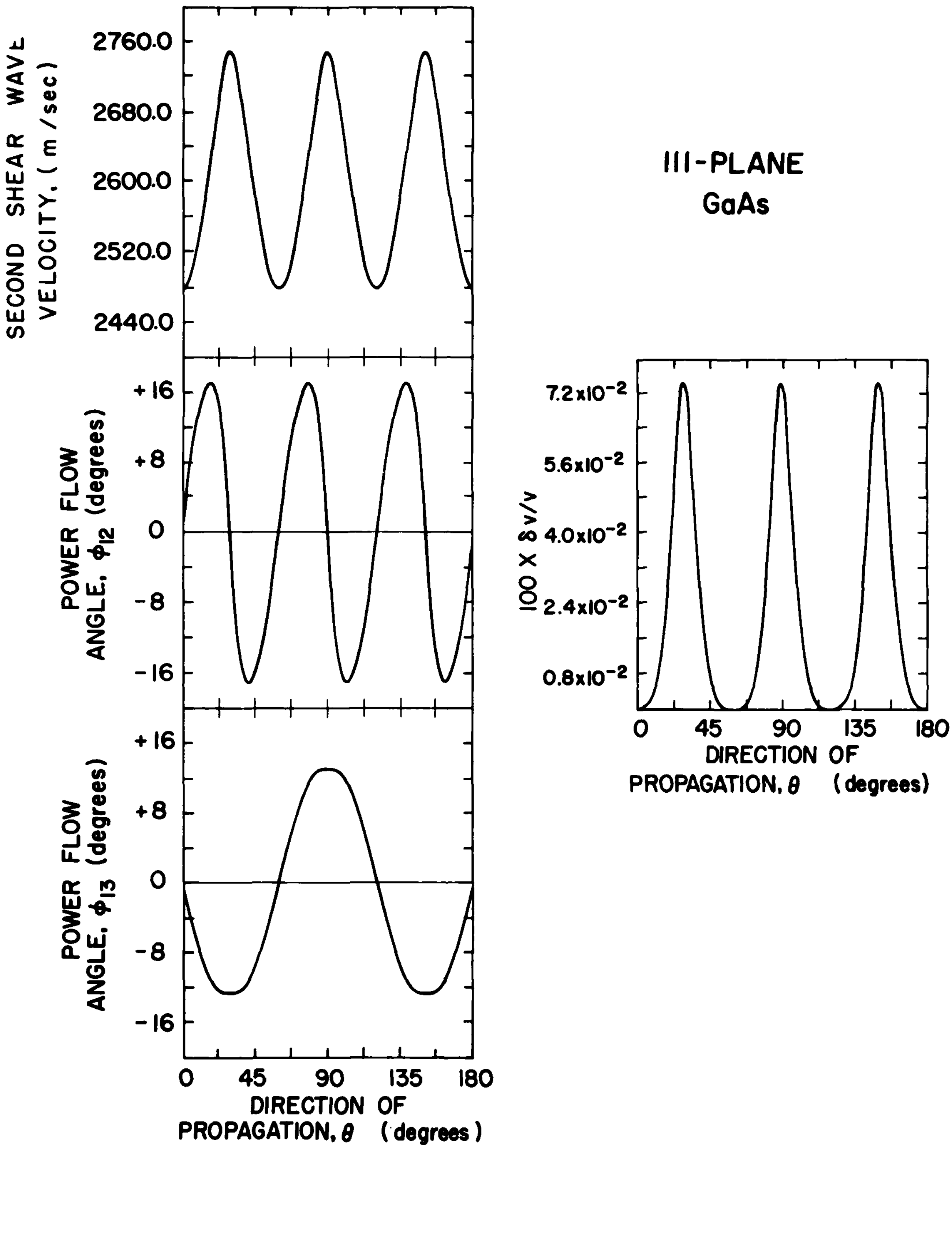


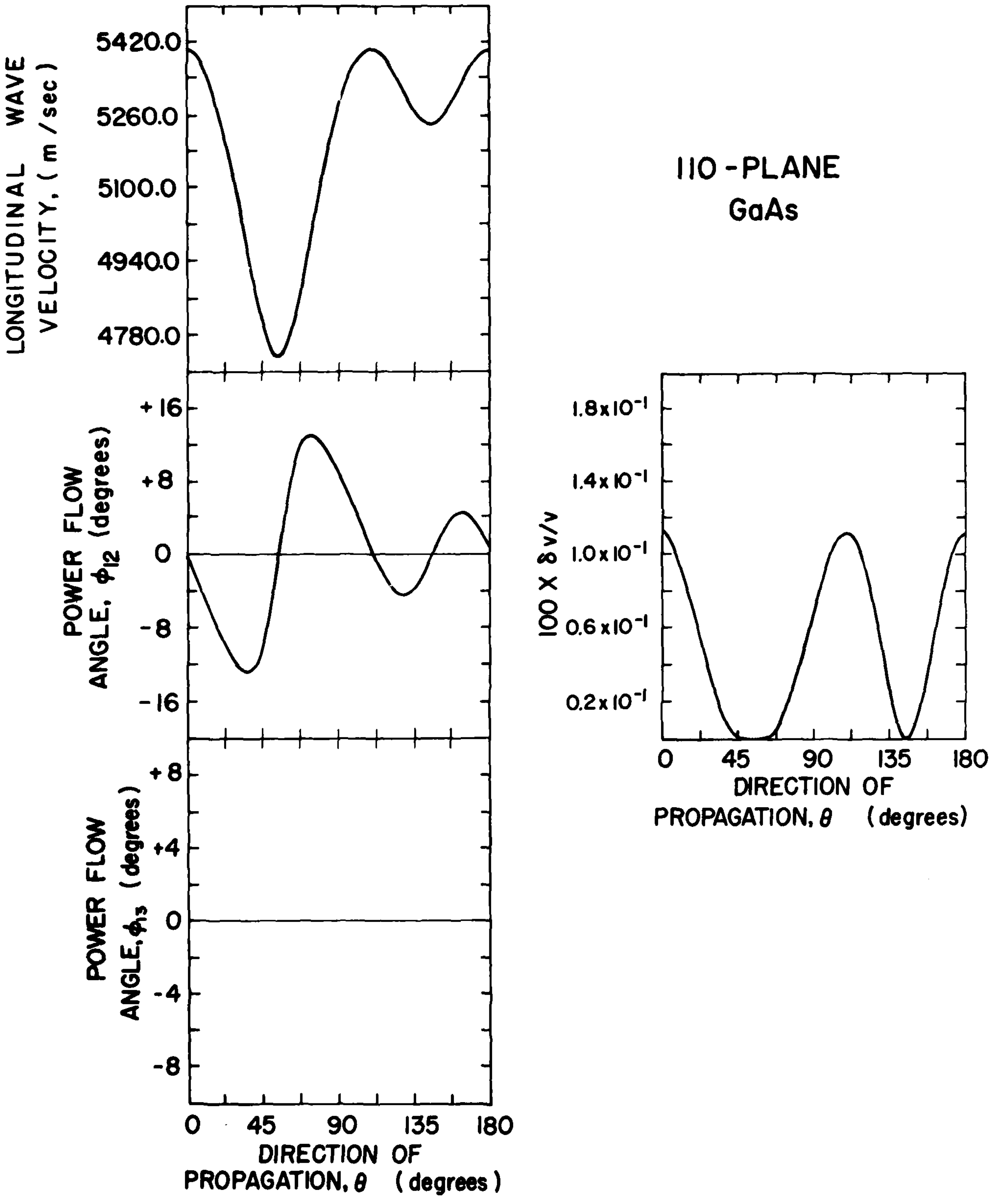
III-PLANE
GaAs



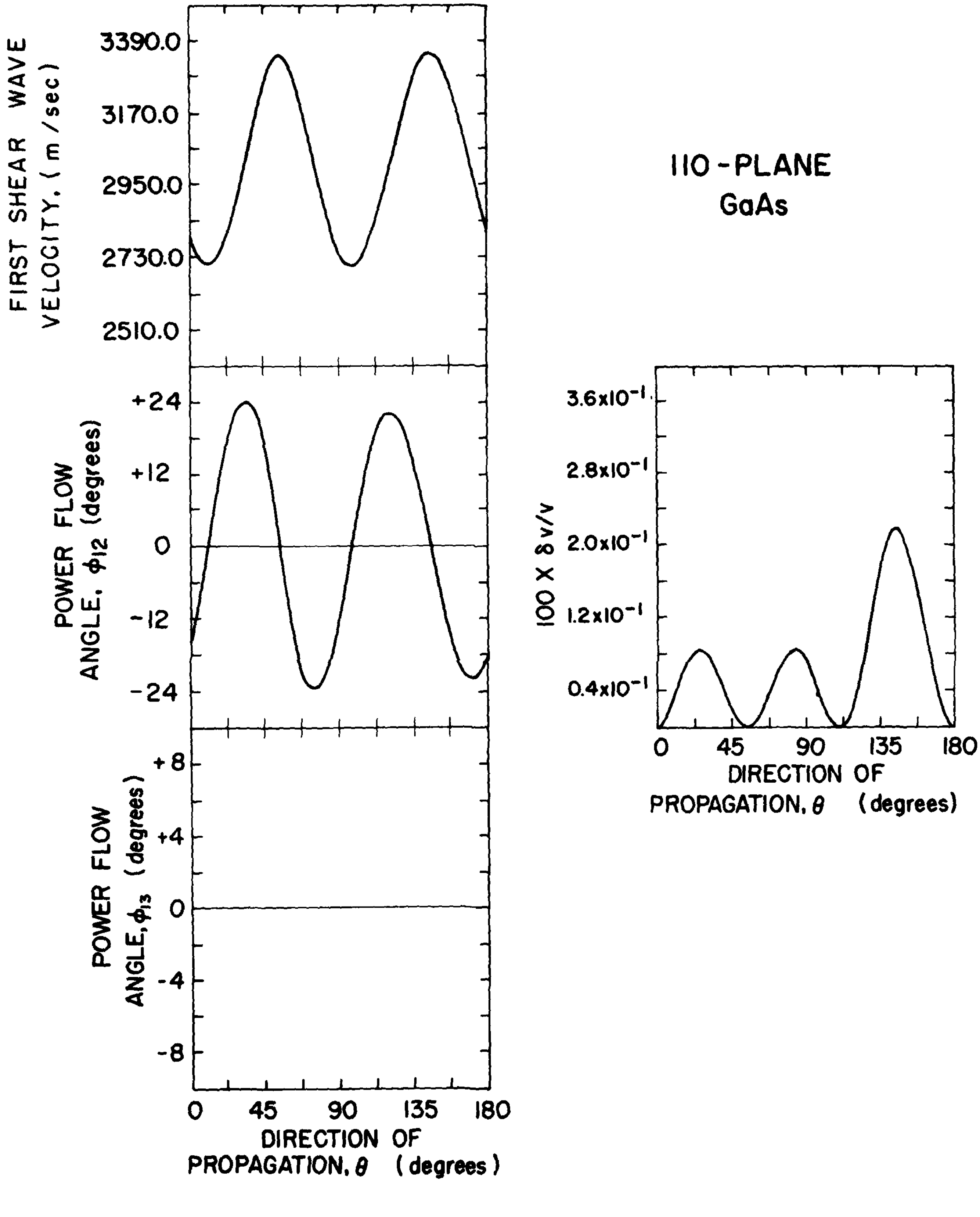


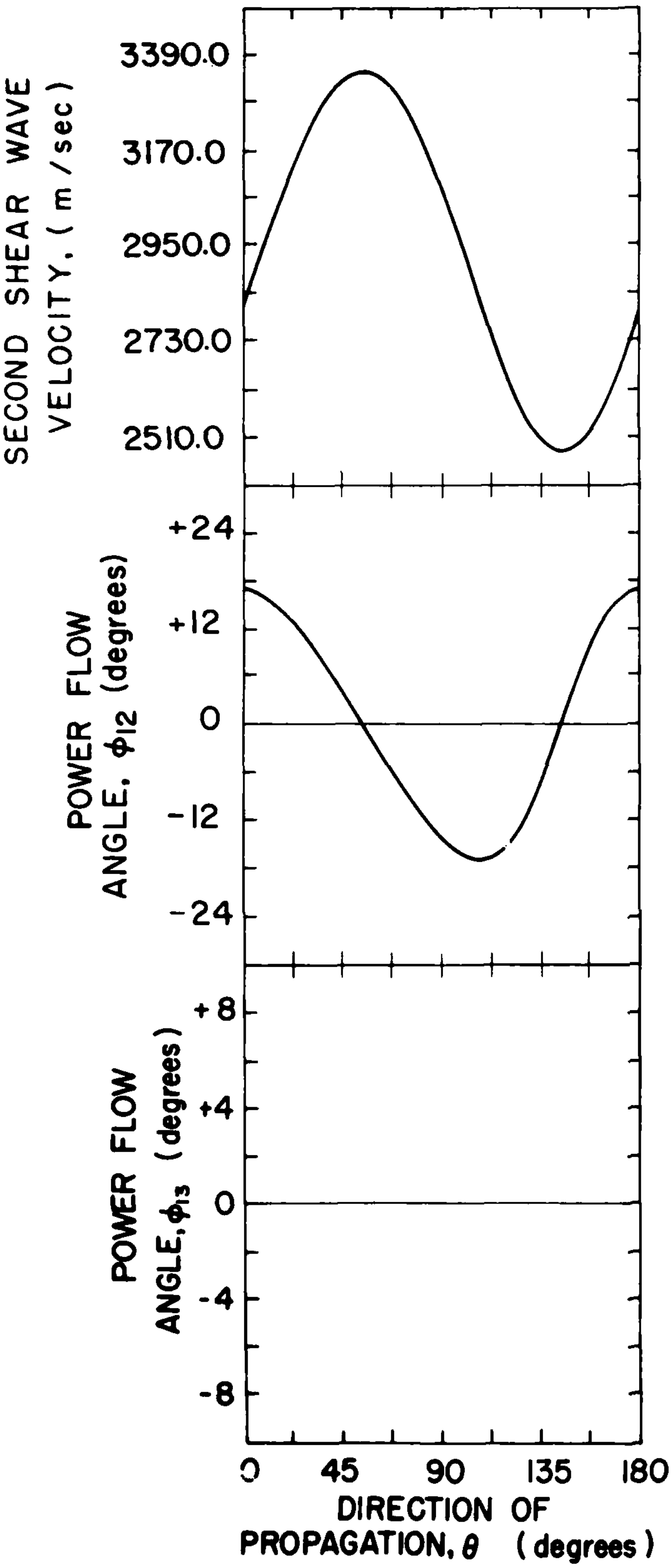
III-PLANE
GaAs
FIRST SHEAR WAVE VELOCITY, (m / sec)
3360.0
3280.0
3200.0
3120.0
3040.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
3.6×10^{-1}
2.8×10^{-1}
2.0×10^{-1}
1.2×10^{-1}
0.4×10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


SECOND SHEAR WAVE VELOCITY, (m /sec)
2760.0
2680.0
2600.0
2520.0
2440.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
III-PLANE
GaAs
100 X $\delta v/v$
7.2x10^{-2}
5.6x10^{-2}
4.0x10^{-2}
2.4x10^{-2}
0.8x10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

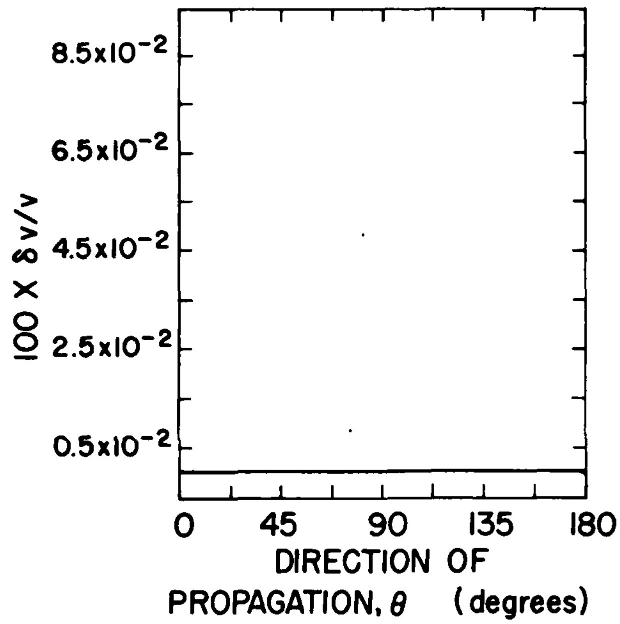


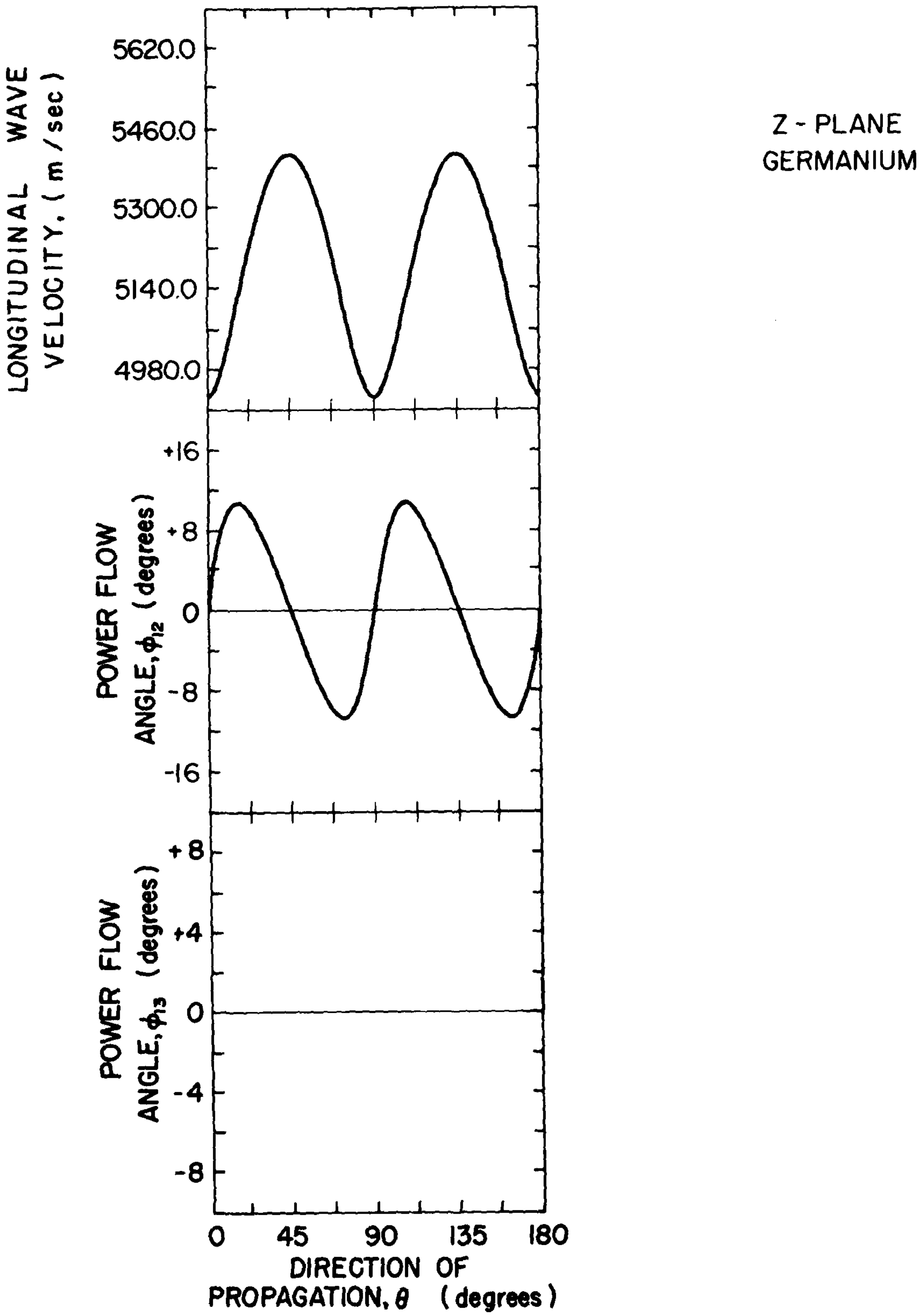
110-PLANE
GaAs
LONGITUDINAL WAVE VELOCITY, (m /sec)
5420.0
5260.0
5100.0
4940.0
4780.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
1.8×10^{-1}
1.4×10^{-1}
1.0×10^{-1}
0.6×10^{-1}
0.2×10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

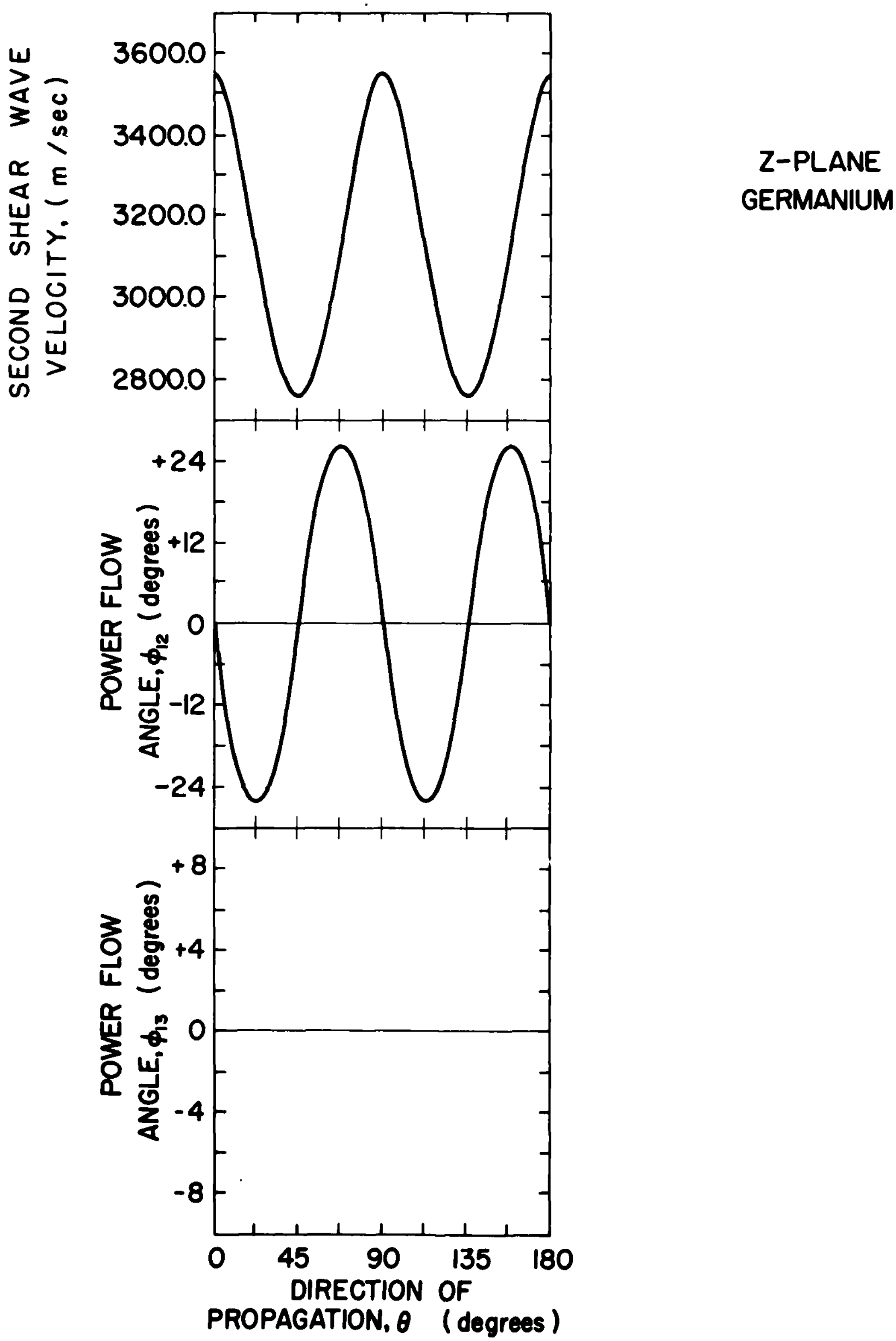

110 - PLANE
GaAs
FIRST SHEAR WAVE VELOCITY, (m /sec)
3390.0
3170.0
2950.0
2730.0
2510.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
3.6x10^{-1}
2.8x10^{-1}
2.0x10^{-1}
1.2x10^{-1}
0.4x10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



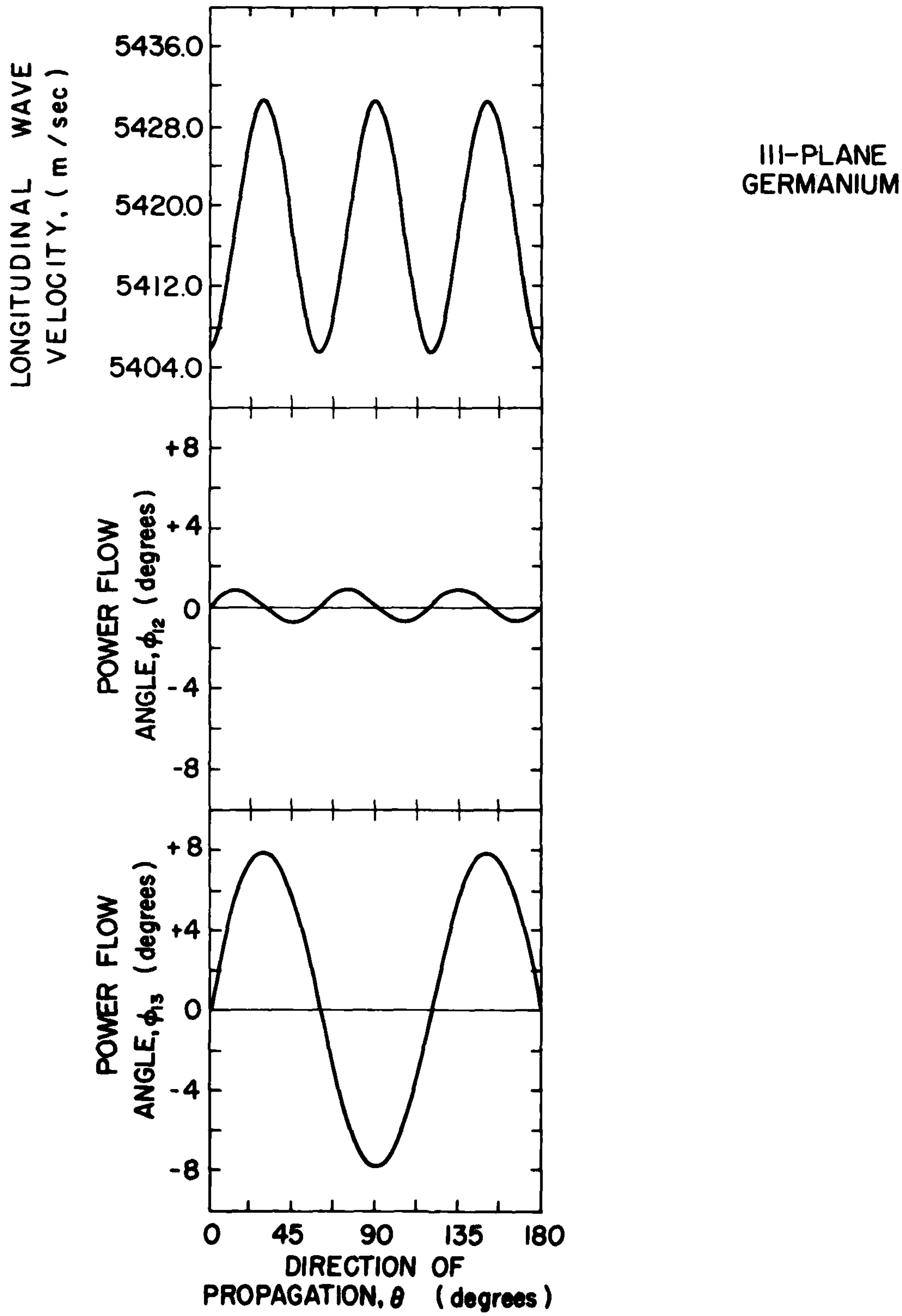
110 - PLANE
GaAs

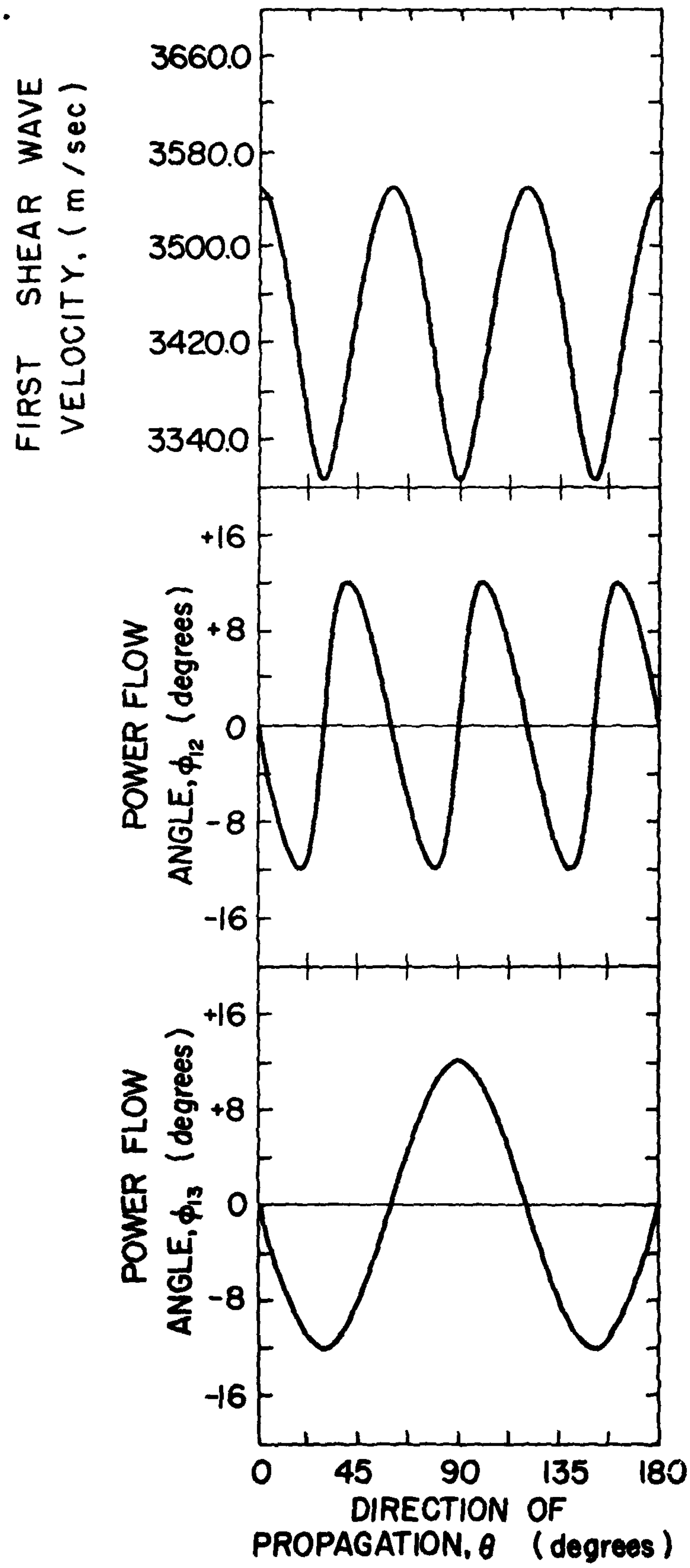



LONGITUDINAL WAVE
VELOCITY, (m / sec)
5620.0
5460.0
5300.0
5140.0
4980.0
POWER FLOW
ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW
ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF
PROPAGATION, θ (degrees)
Z - PLANE
GERMANIUM

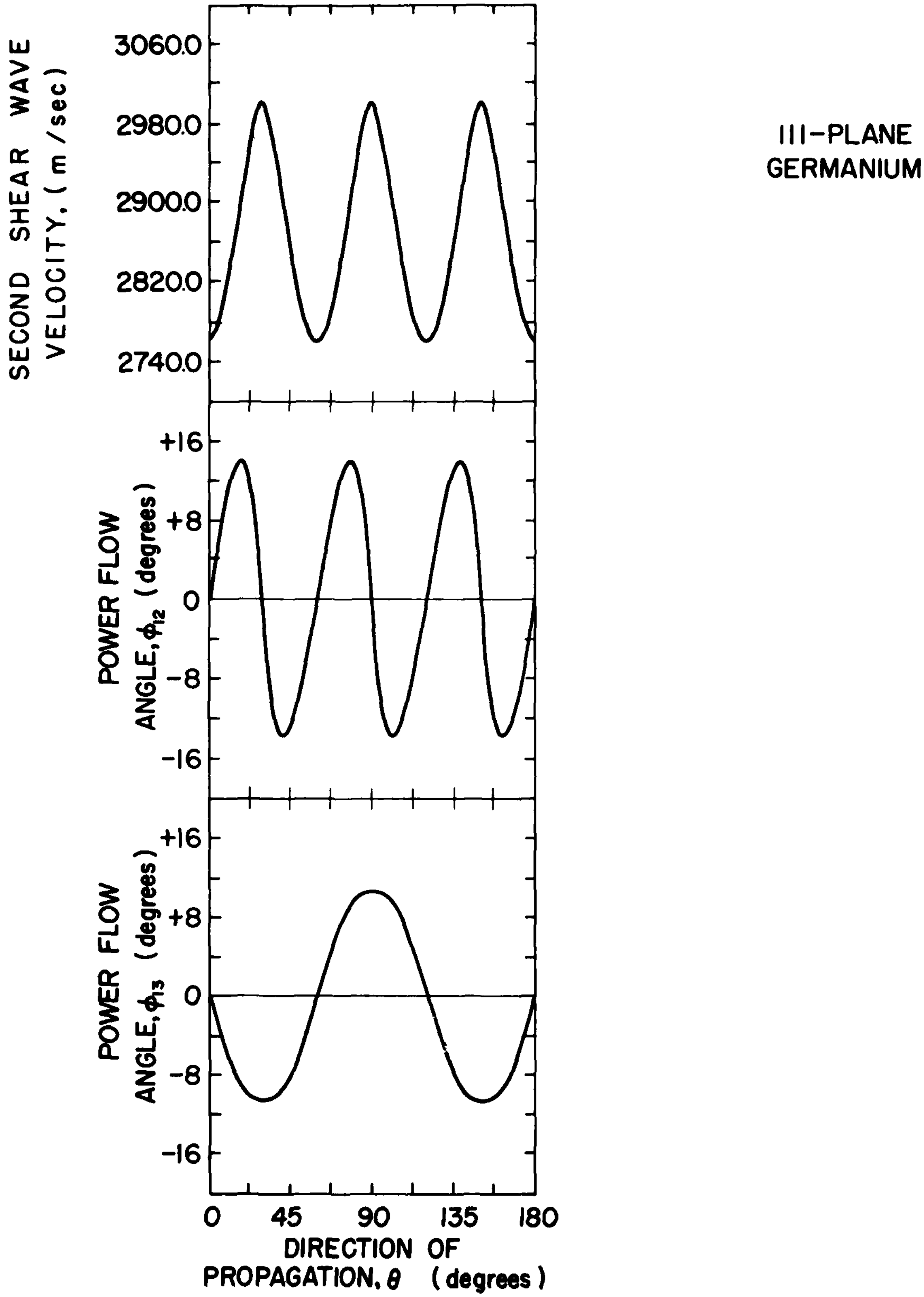


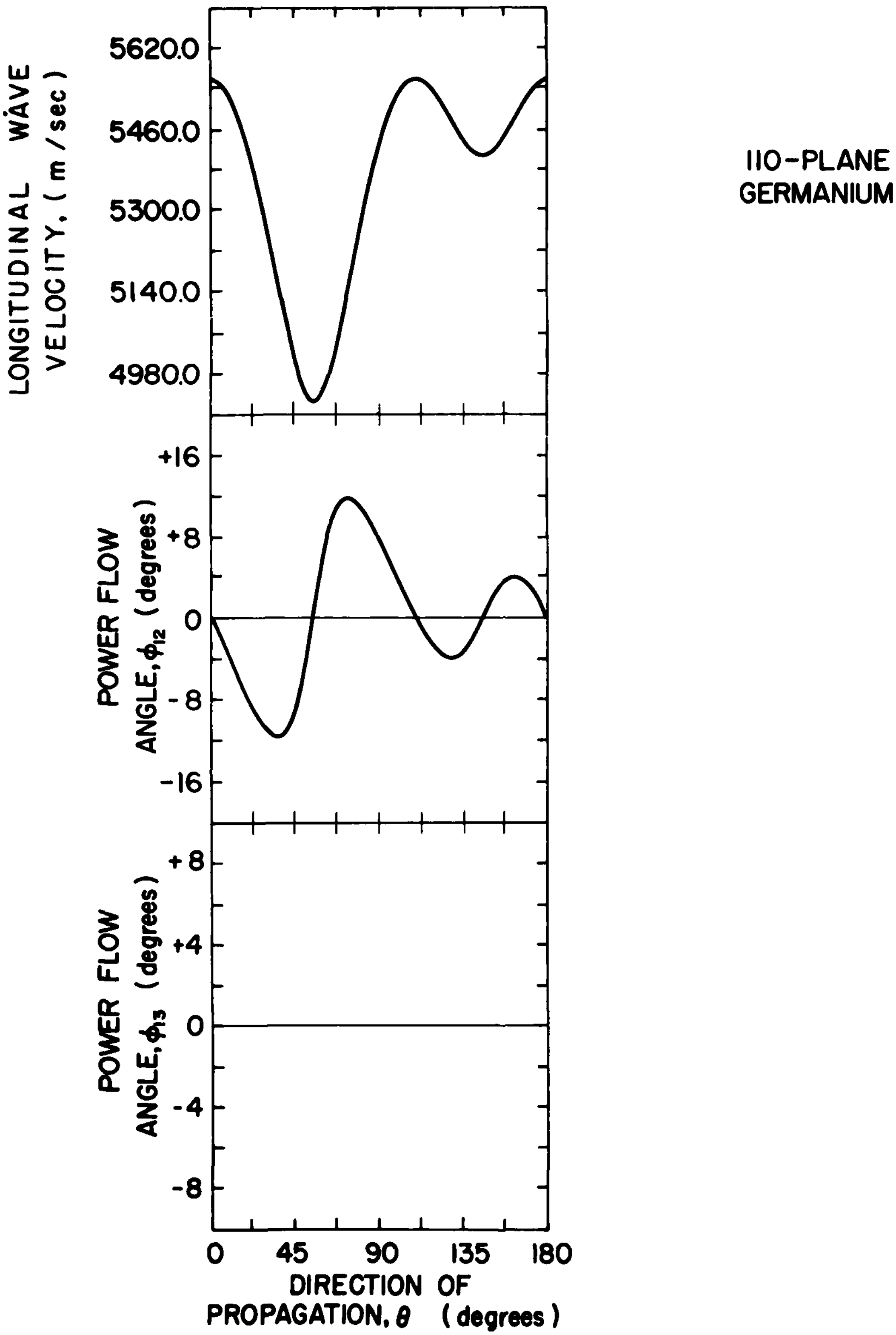
SECOND SHEAR WAVE VELOCITY, (m /sec)
3600.0
3400.0
3200.0
3000.0
2800.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
GERMANIUM

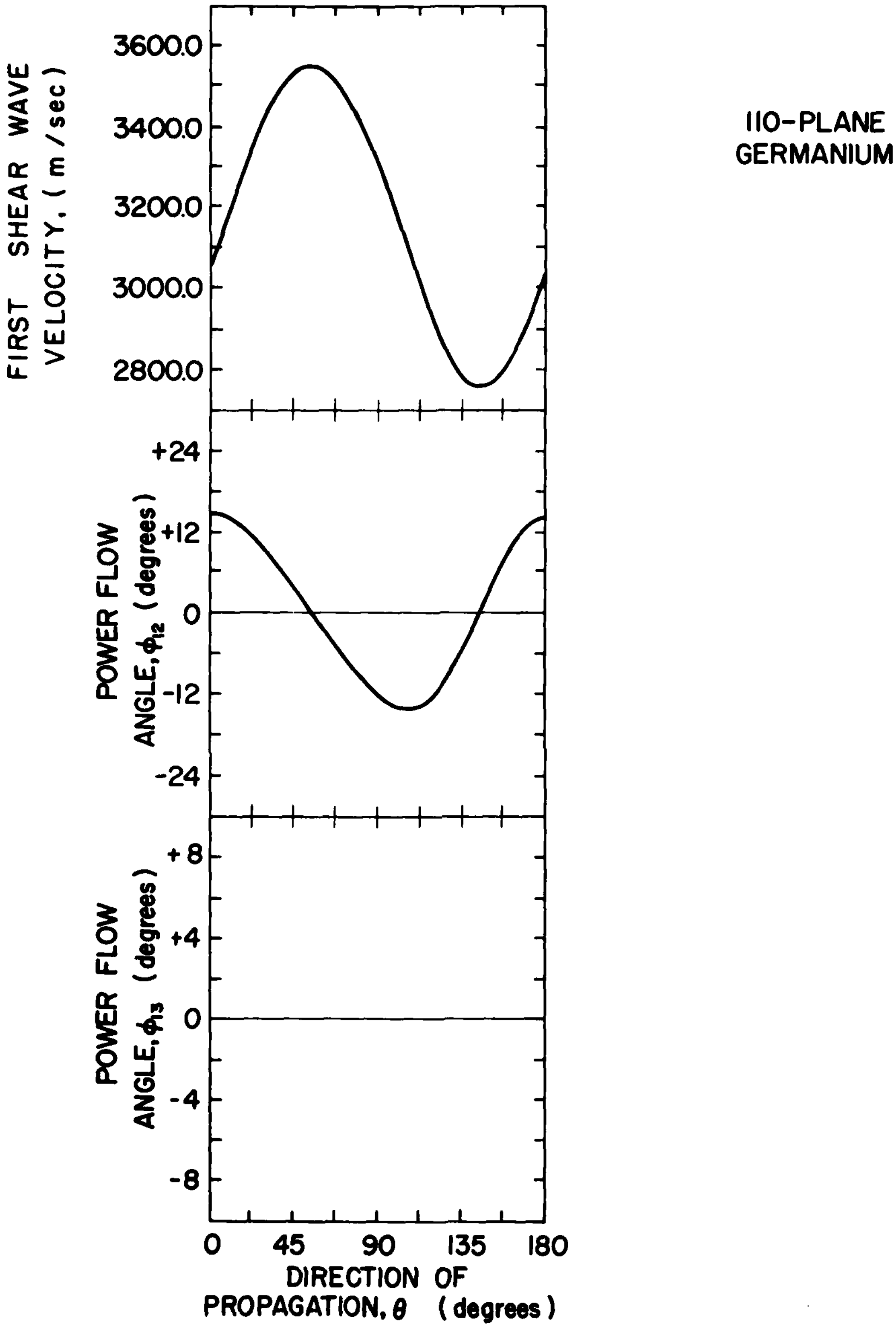

5436.0
5428.0
5420.0
5412.0
5404.0
LONGITUDINAL WAVE VELOCITY, (m/sec)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{12} (degrees)
POWER FLOW ANGLE, ϕ_{13} (degrees)
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
GERMANIUM



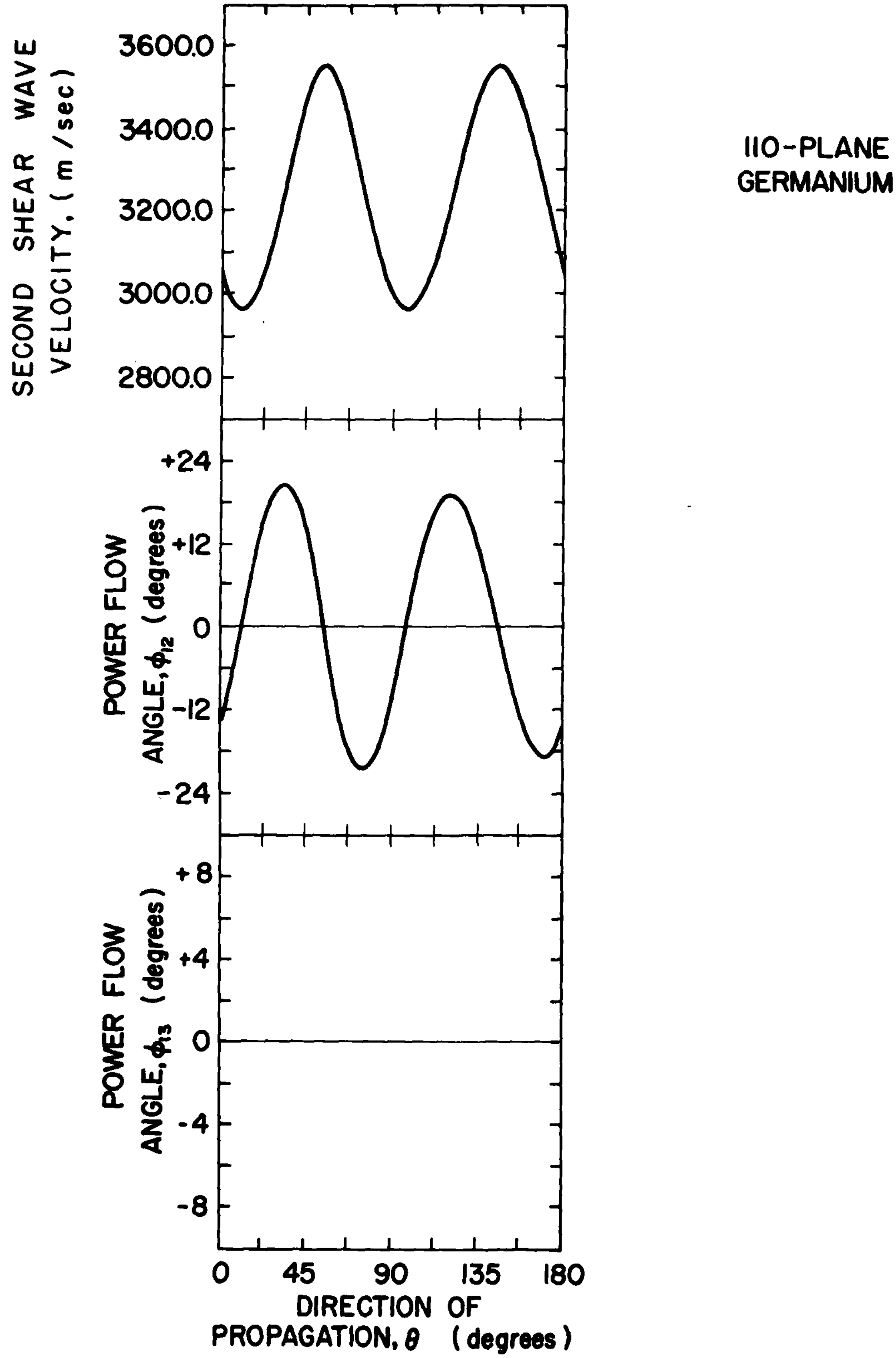
111 - PLANE
GERMANIUM

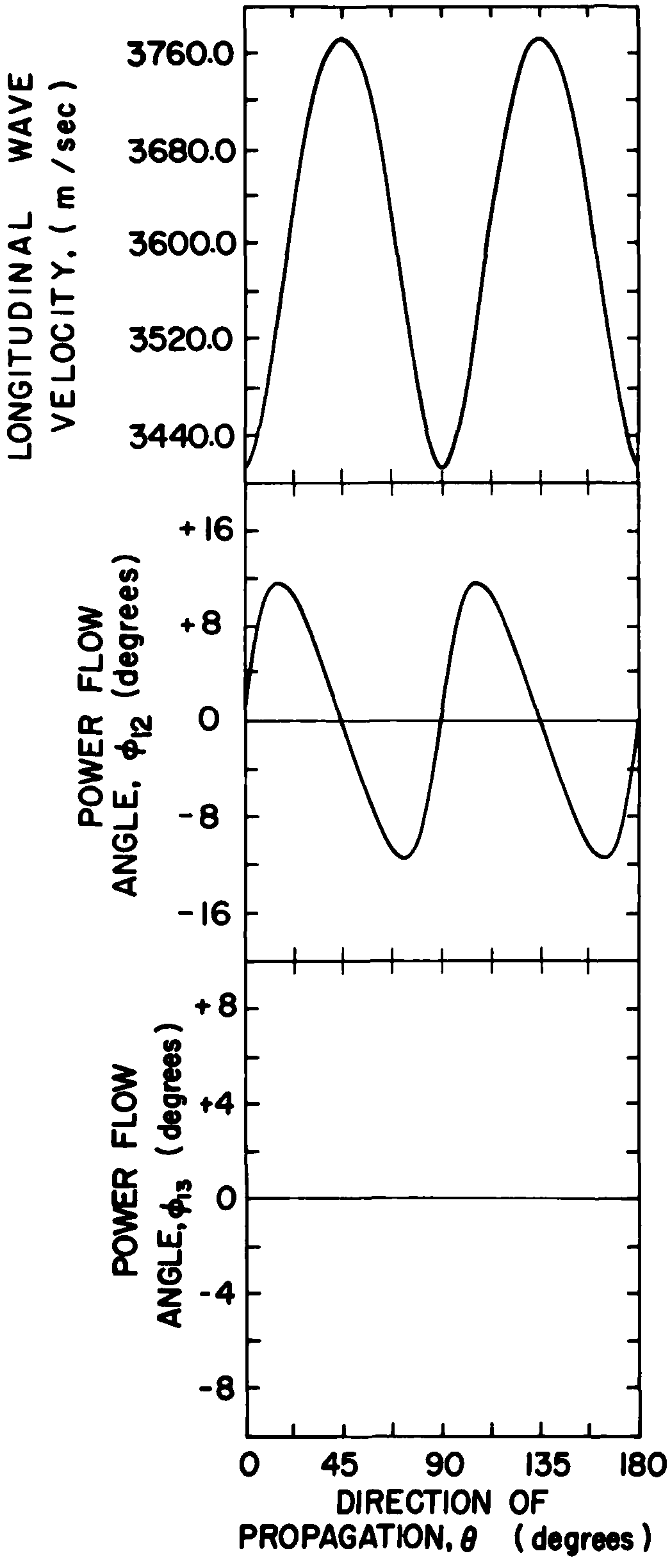

SECOND SHEAR WAVE VELOCITY, (m/sec)
3060.0
2980.0
2900.0
2820.0
2740.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
GERMANIUM


LONGITUDINAL WAVE VELOCITY, (m /sec)
5620.0
5460.0
5300.0
5140.0
4980.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE
GERMANIUM



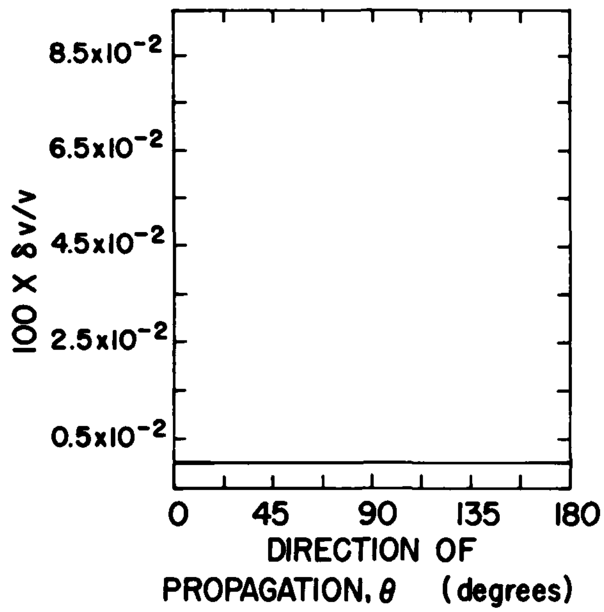
FIRST SHEAR WAVE VELOCITY, (m / sec)
3600.0
3400.0
3200.0
3000.0
2800.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE
GERMANIUM


SECOND SHEAR WAVE VELOCITY, (m/sec)
3600.0
3400.0
3200.0
3000.0
2800.0
110-PLANE
GERMANIUM
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



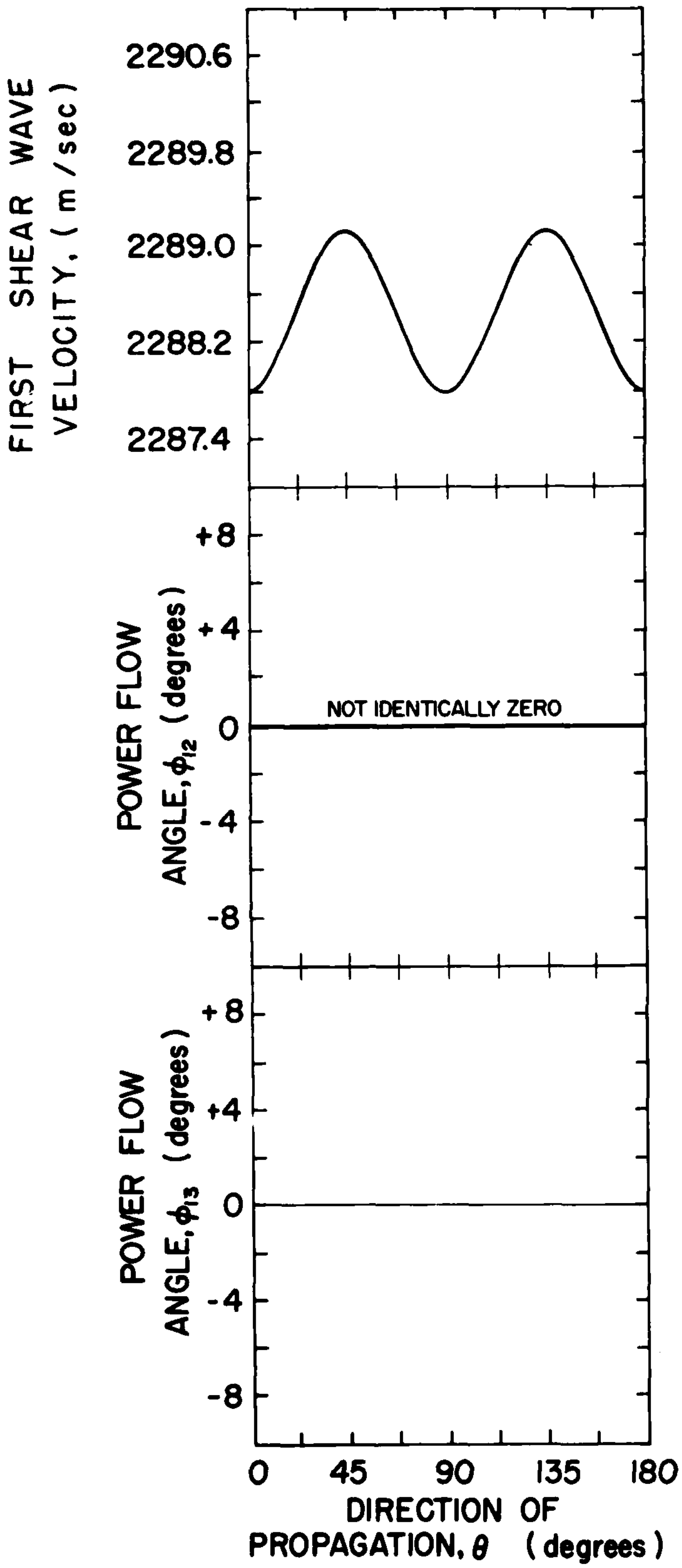
LONGITUDINAL WAVE VELOCITY, (m / sec)
3760.0
3680.0
3600.0
3520.0
3440.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

Z-PLANE
InSb

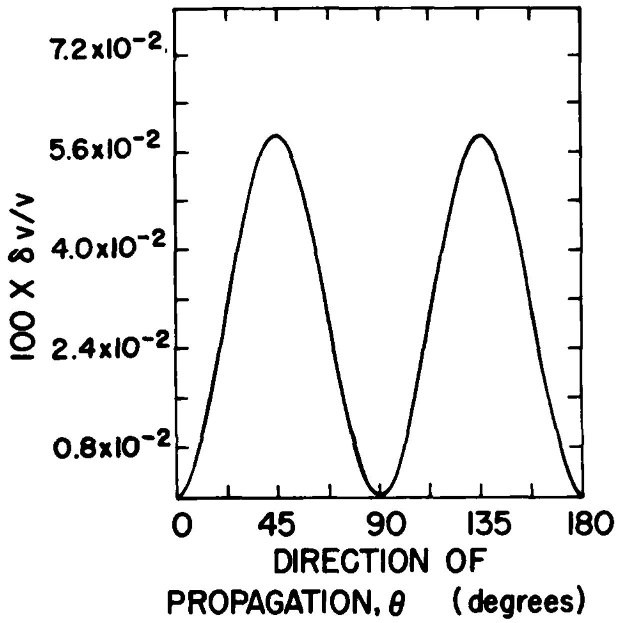


100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

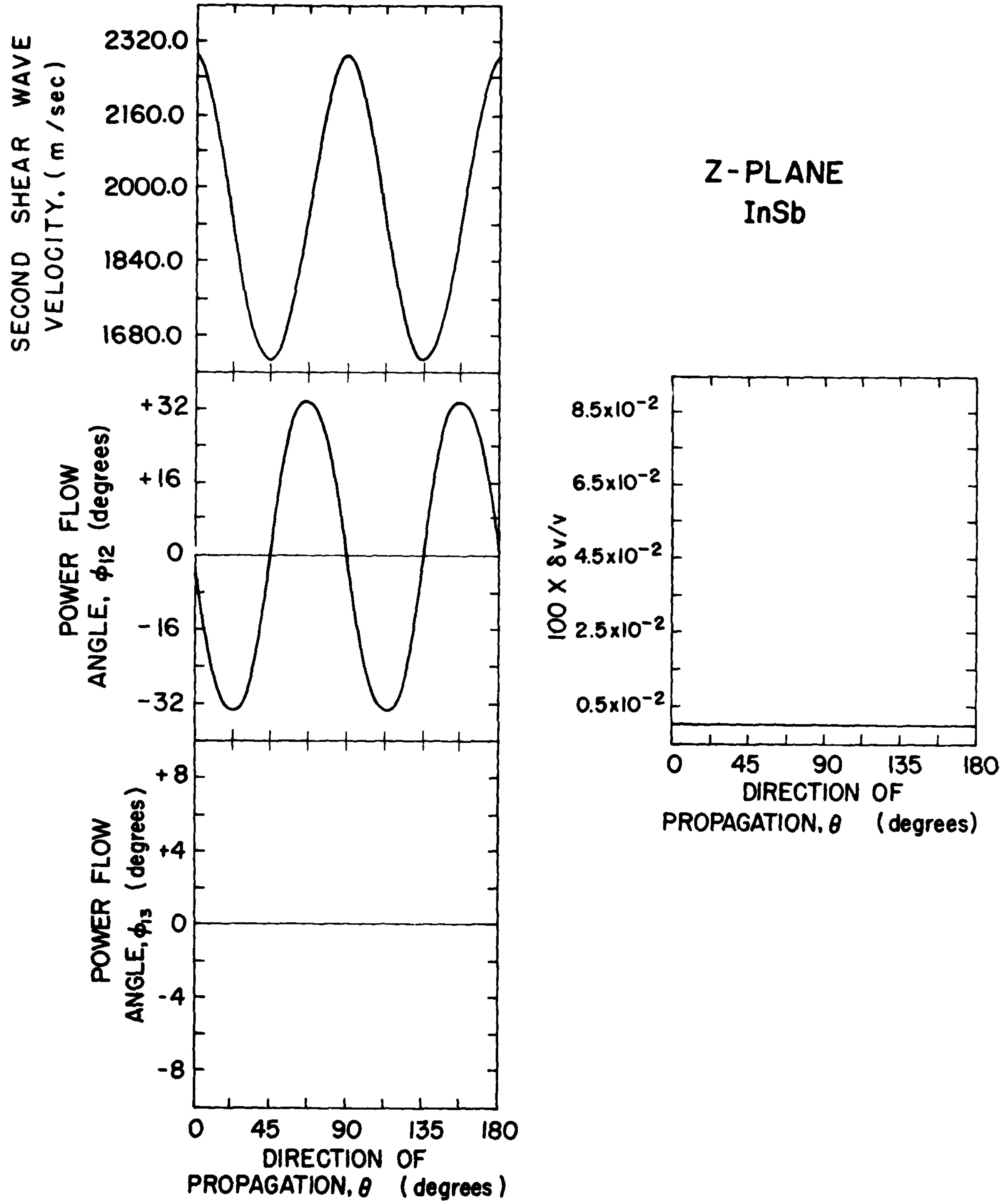
Z-PLANE
InSb

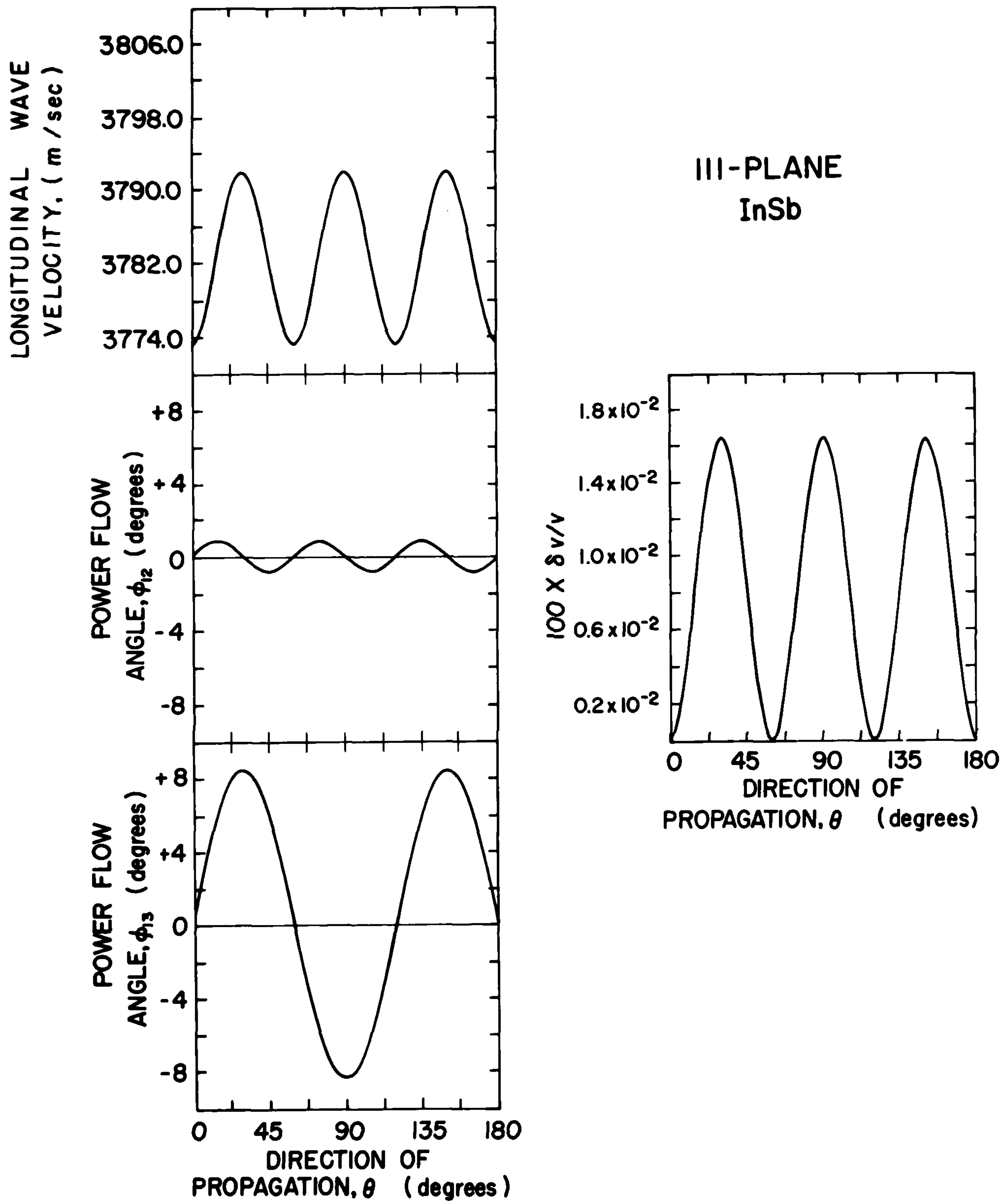


FIRST SHEAR WAVE VELOCITY, (m / sec)
2290.6
2289.8
2289.0
2288.2
2287.4
POWER FLOW ANGLE, ϕ_{12} (degrees)
NOT IDENTICALLY ZERO
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

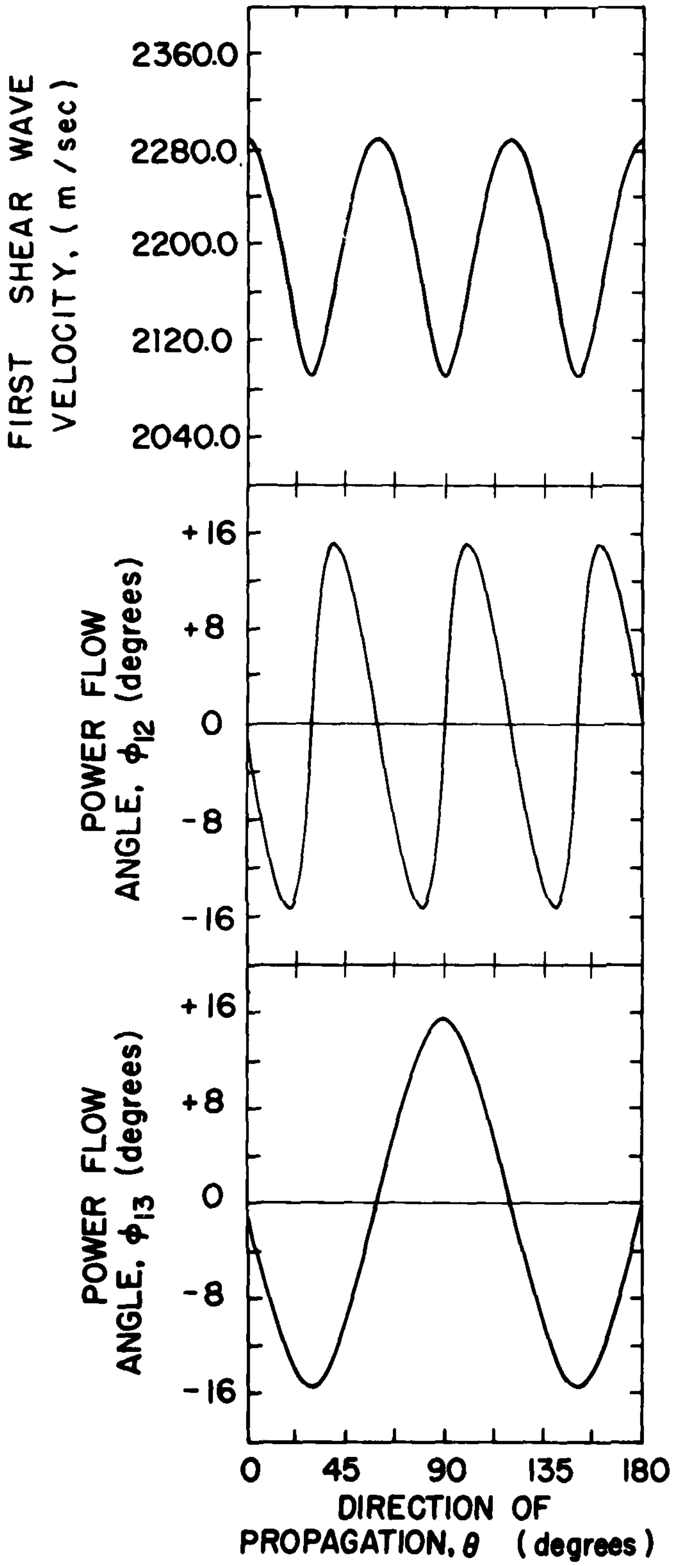


100 X $\delta v/v$
7.2×10^{-2}
5.6×10^{-2}
4.0×10^{-2}
2.4×10^{-2}
0.8×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

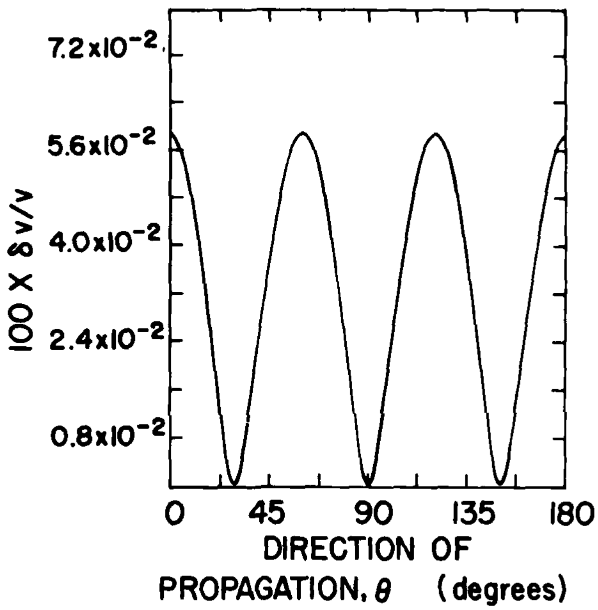

Z-PLANE
InSb
SECOND SHEAR WAVE VELOCITY, (m/sec)
2320.0
2160.0
2000.0
1840.0
1680.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+32
+16
0
-16
-32
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

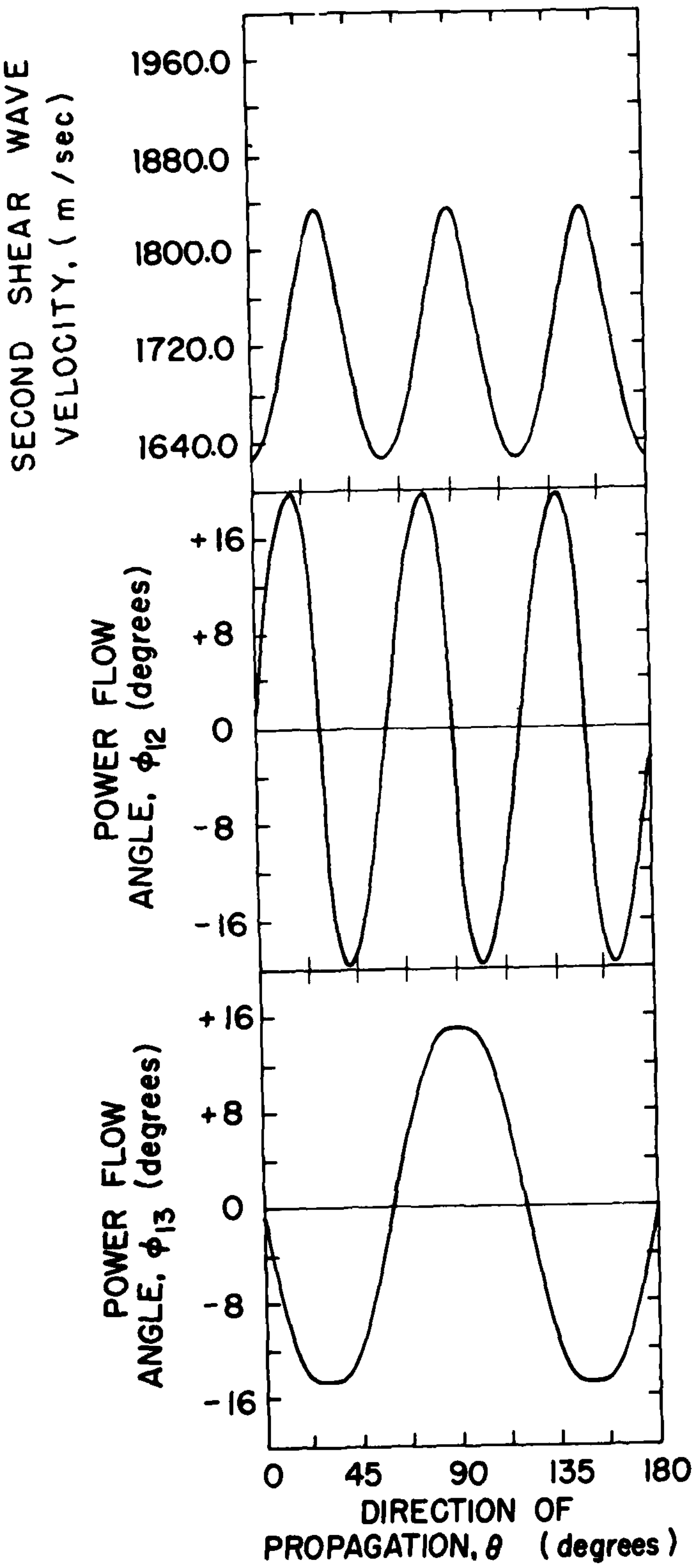


LONGITUDINAL WAVE VELOCITY, (m / sec)
3806.0
3798.0
3790.0
3782.0
3774.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
III-PLANE
InSb
$100 \times \delta v/v$
1.8×10^{-2}
1.4×10^{-2}
1.0×10^{-2}
0.6×10^{-2}
0.2×10^{-2}

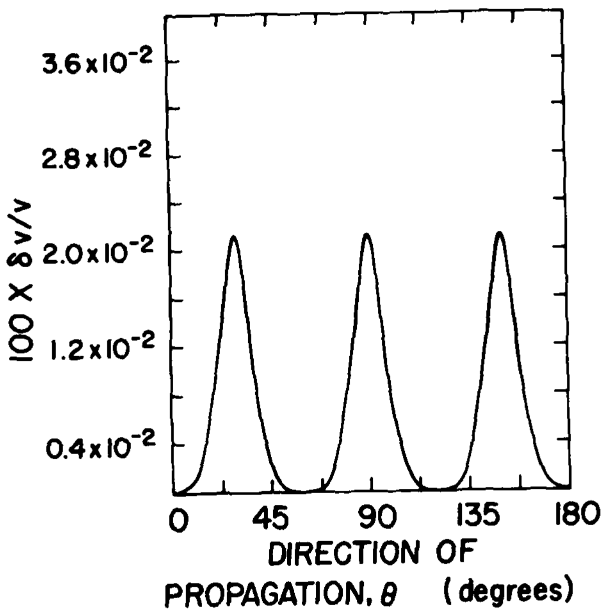


111-PLANE
InSb



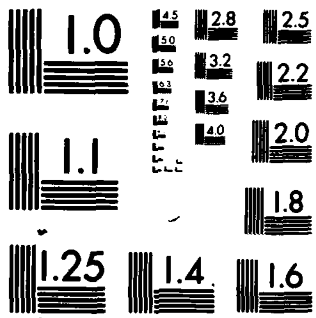


111-PLANE
InSb



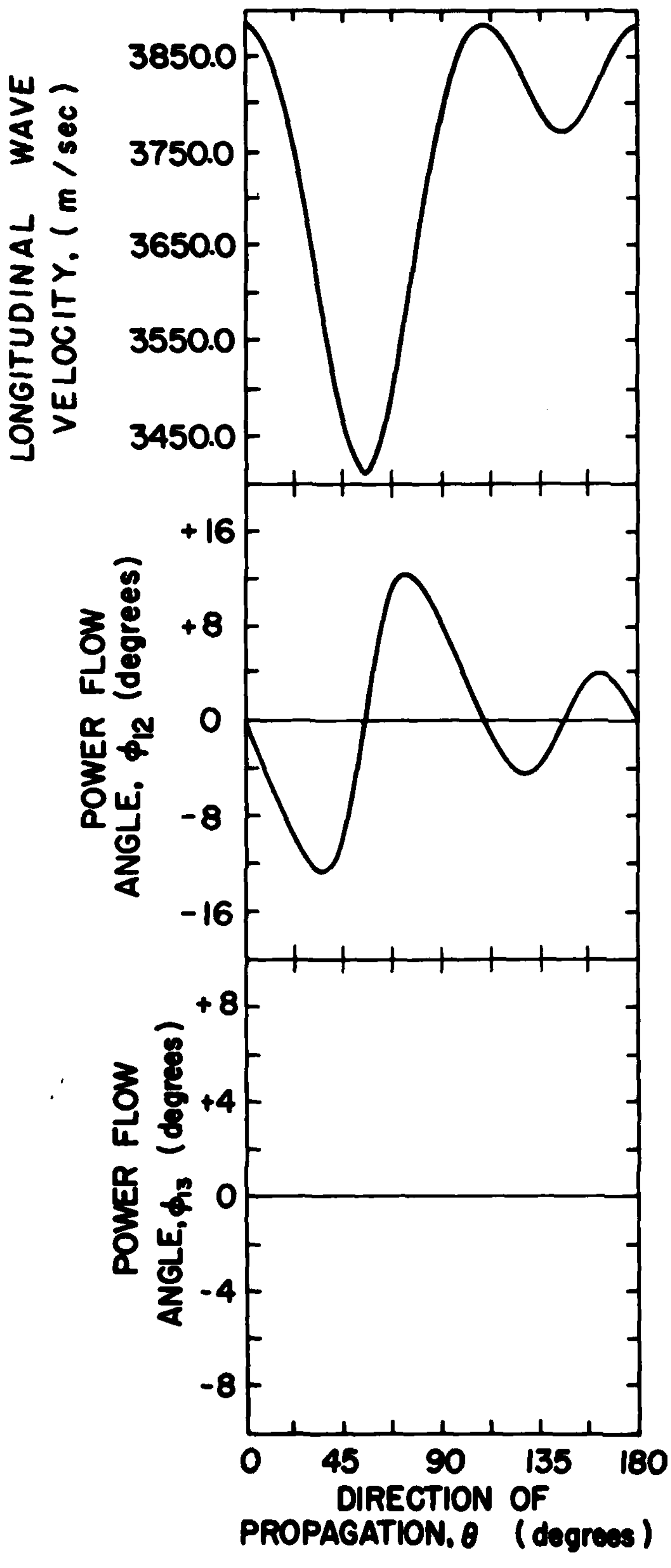
AD-A090 947 ROME AIR DEVELOPMENT CENTER GRIFFISS AFB NY F/G 20/1
MICROWAVE ACOUSTICS HANDBOOK. VOLUME 3. BULK WAVE VELOCITIES.(U)
MAY 80 A J SLOBODNIK, R T DELMONICO
UNCLASSIFIED RADC-TR-80-188-VOL-3 NL

2 of 6

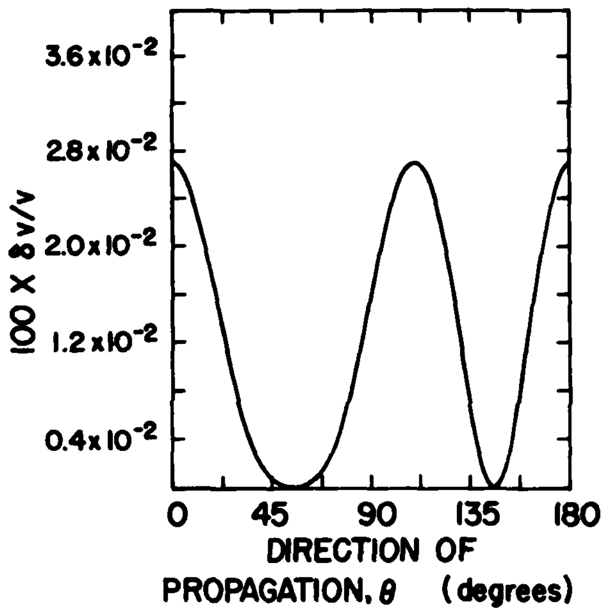


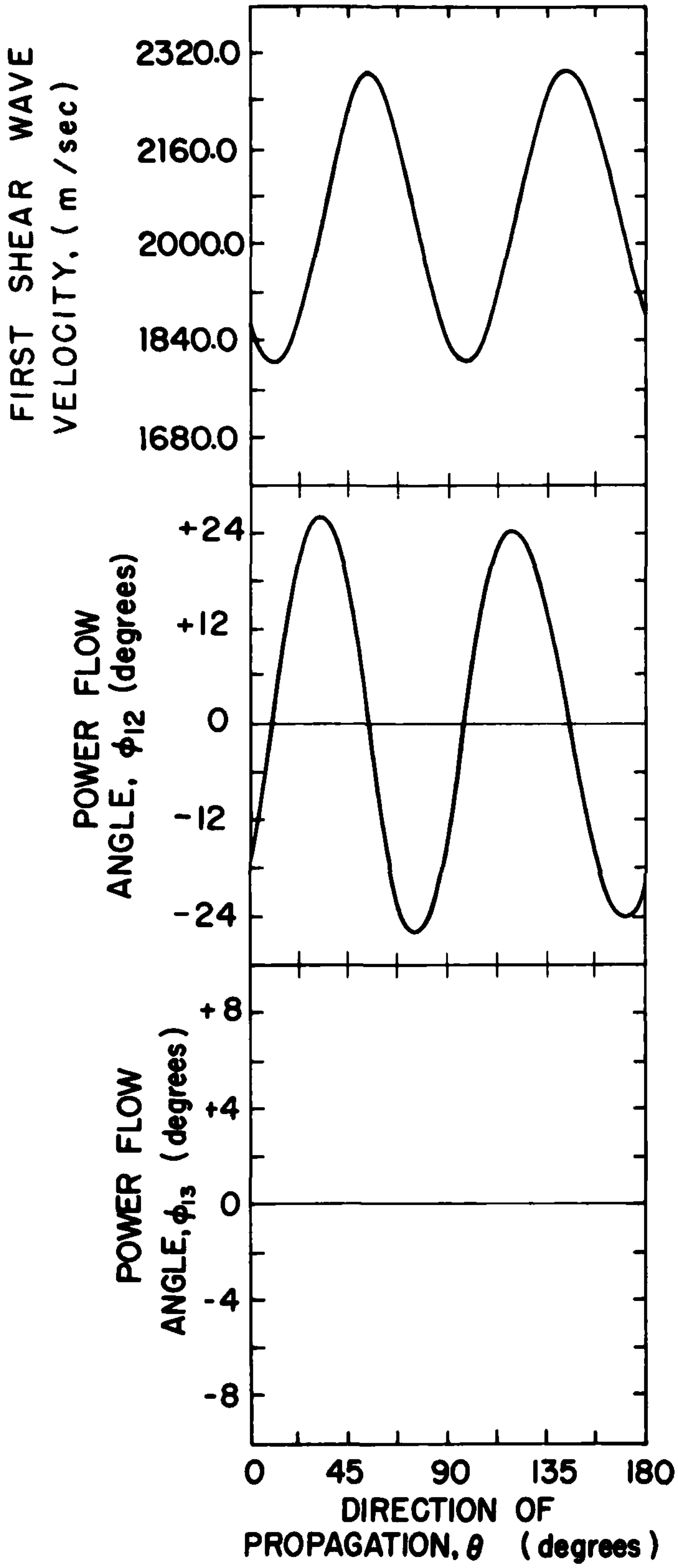
MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

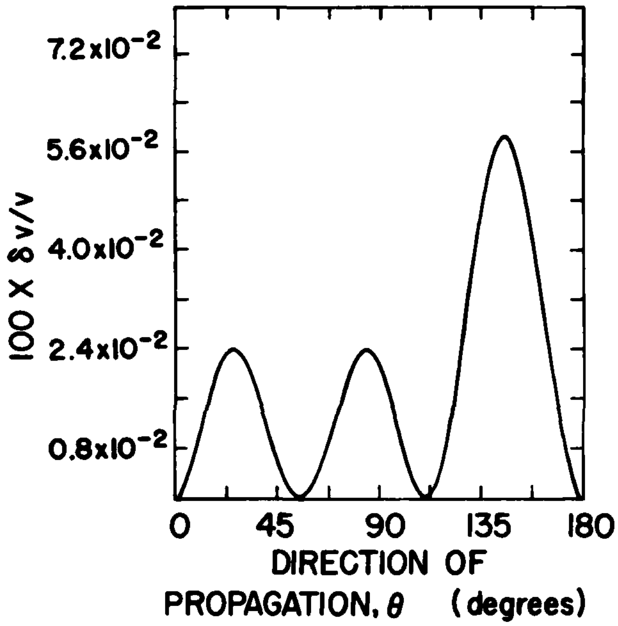


110 -PLANE
InSb

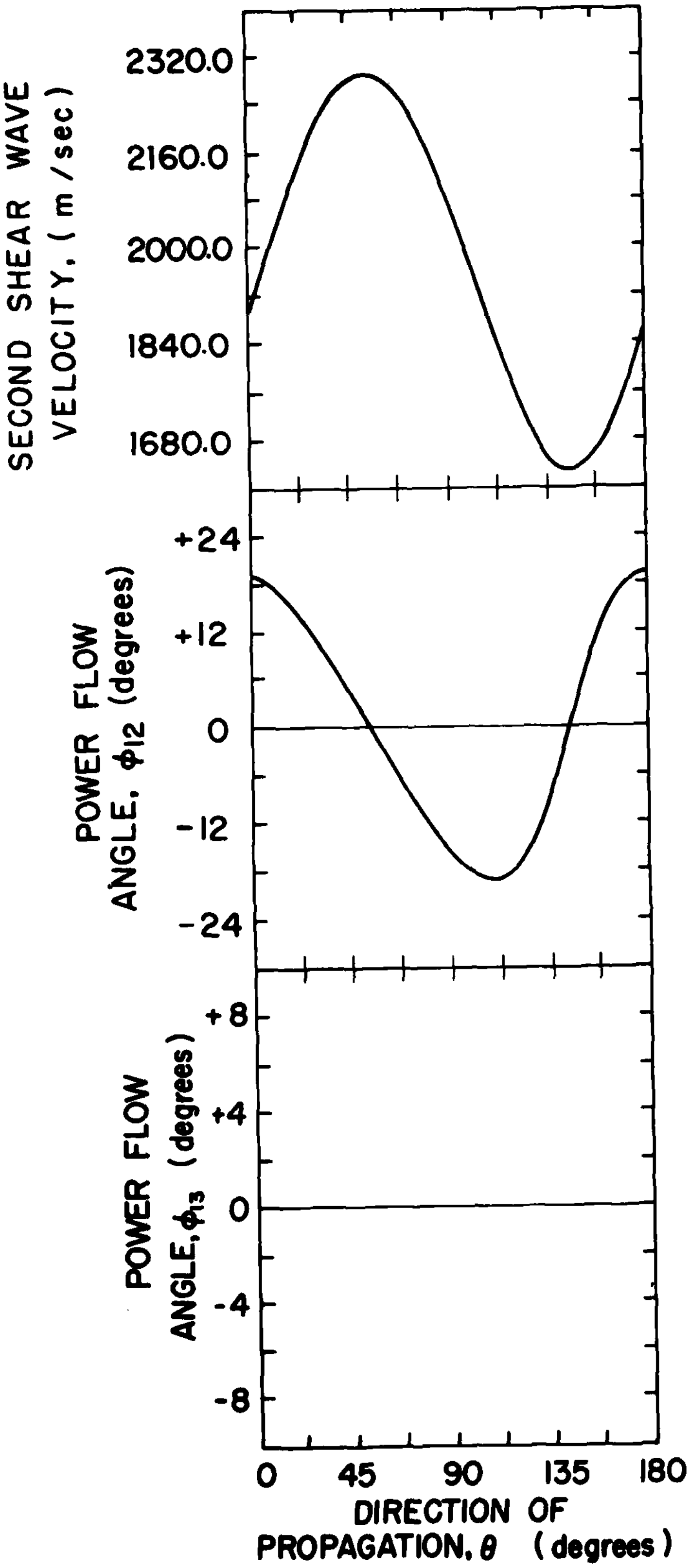


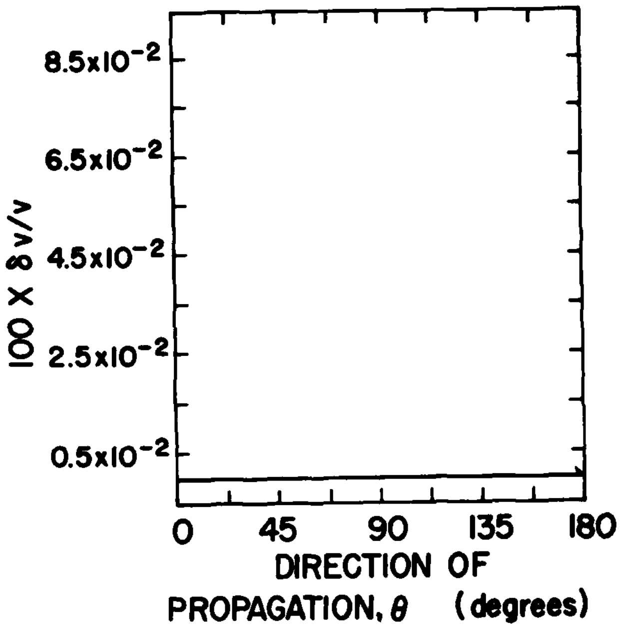


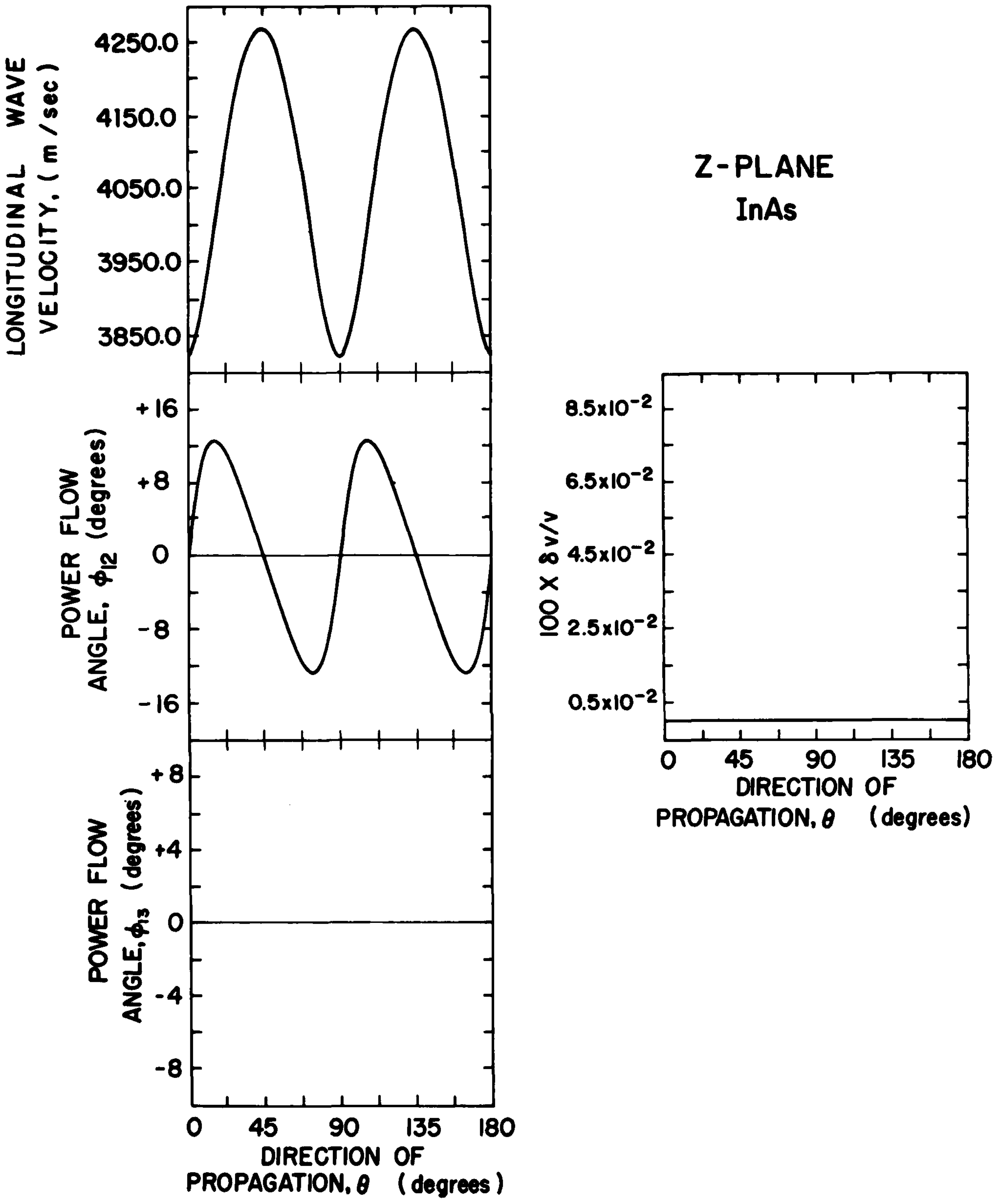
110-PLANE
InSb



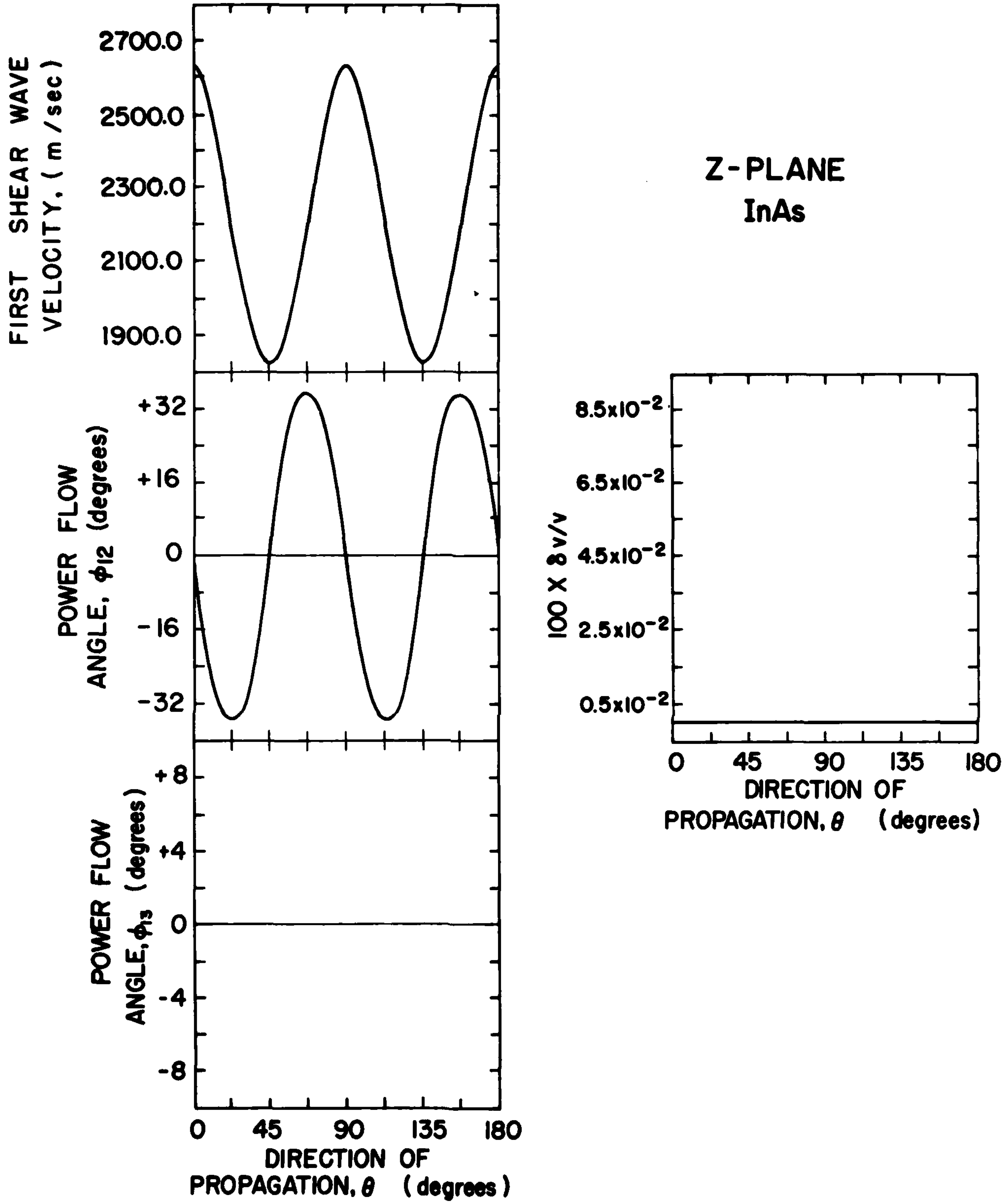
110 - PLANE
InSb



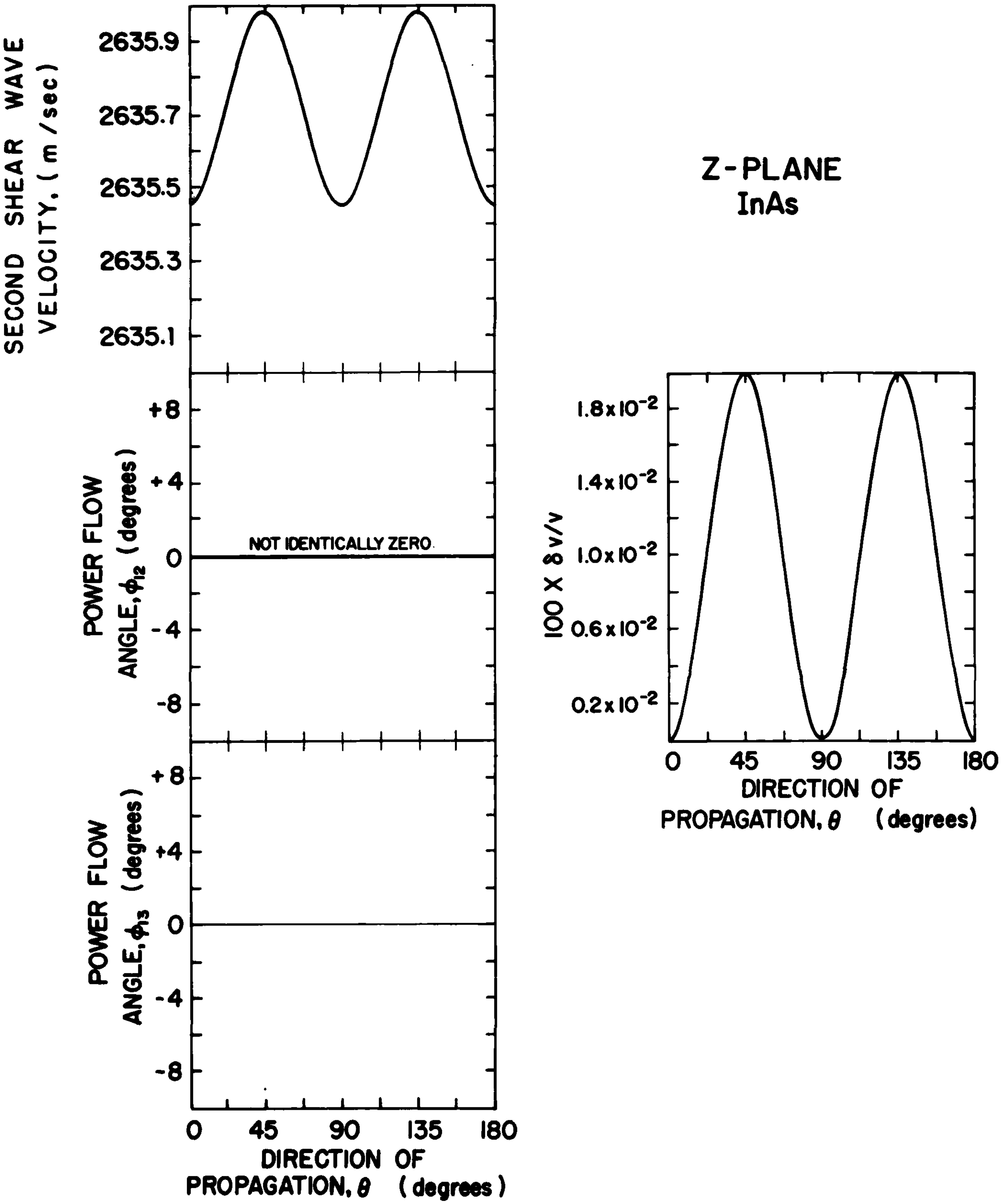


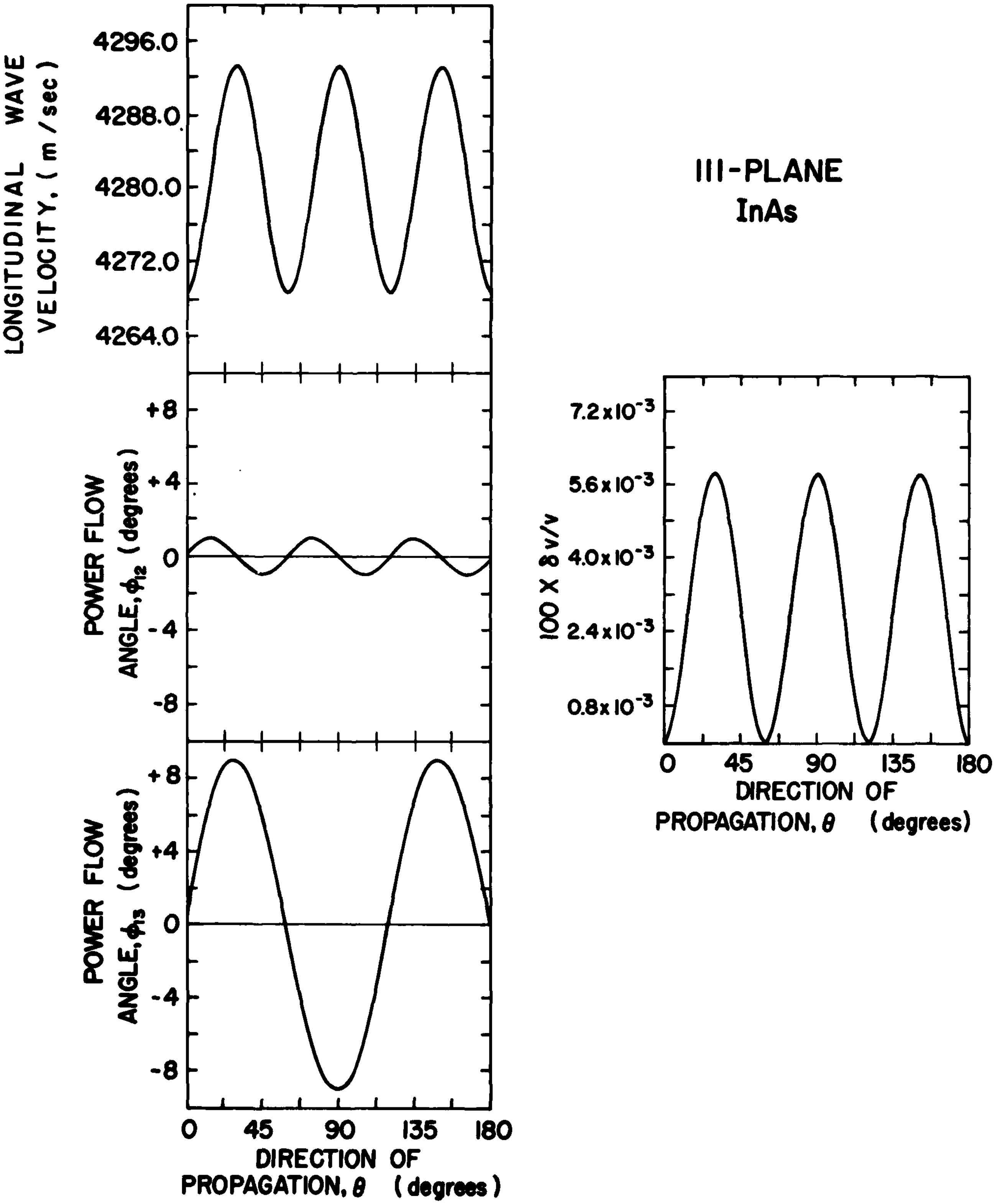


Z-PLANE
InAs
LONGITUDINAL WAVE VELOCITY, (m/sec)
4250.0
4150.0
4050.0
3950.0
3850.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}

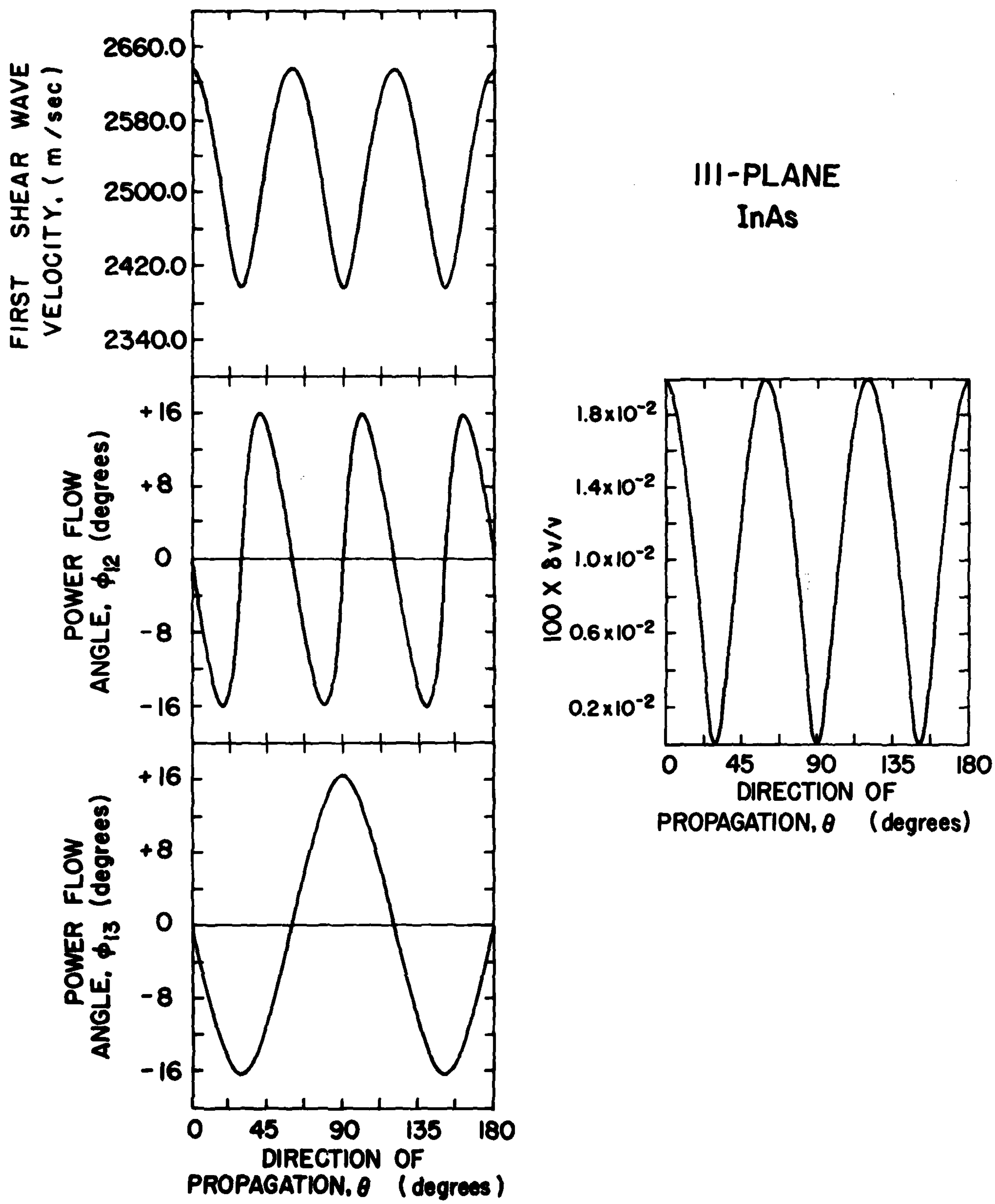


Z-PLANE
InAs
FIRST SHEAR WAVE VELOCITY, (m/sec)
2700.0
2500.0
2300.0
2100.0
1900.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+32
+16
0
-16
-32
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

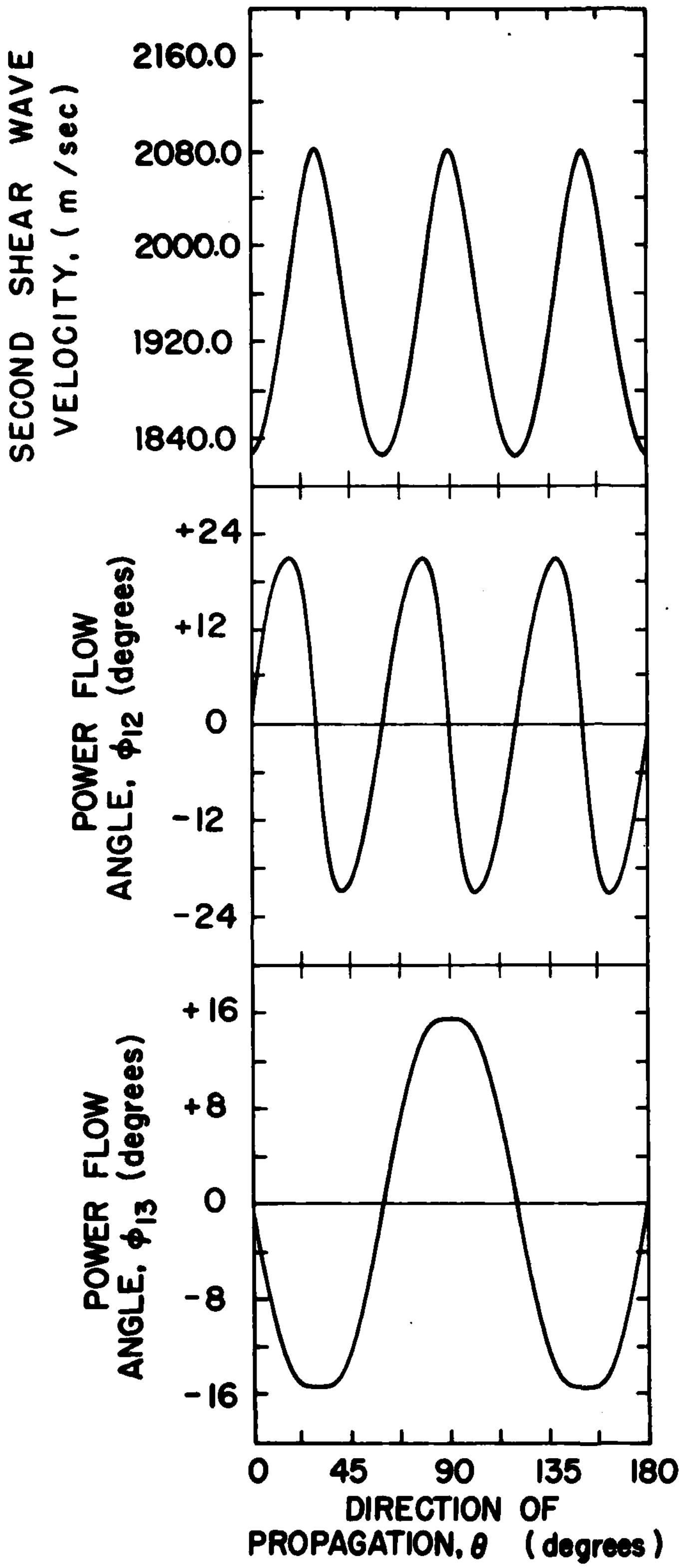

Z-PLANE
InAs
SECOND SHEAR WAVE VELOCITY, (m/sec)
2635.9
2635.7
2635.5
2635.3
2635.1
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
NOT IDENTICALLY ZERO
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
1.8×10^{-2}
1.4×10^{-2}
1.0×10^{-2}
0.6×10^{-2}
0.2×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



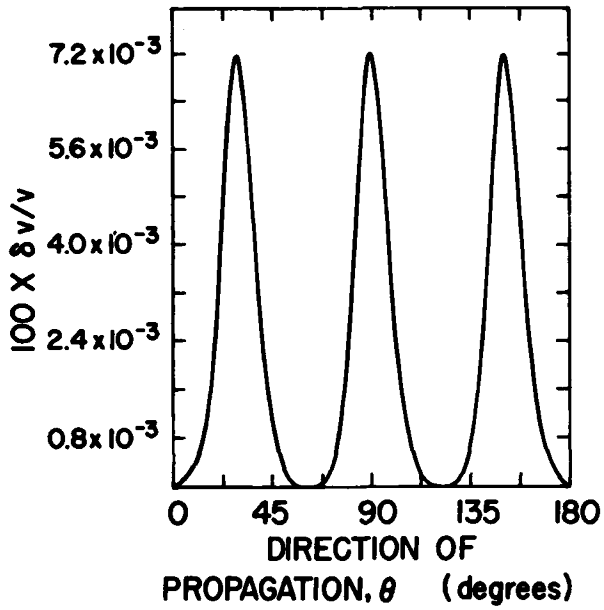
LONGITUDINAL WAVE VELOCITY, (m / sec)
4296.0
4288.0
4280.0
4272.0
4264.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
III-PLANE
InAs
$100 \times \delta v/v$
7.2×10^{-3}
5.6×10^{-3}
4.0×10^{-3}
2.4×10^{-3}
0.8×10^{-3}
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

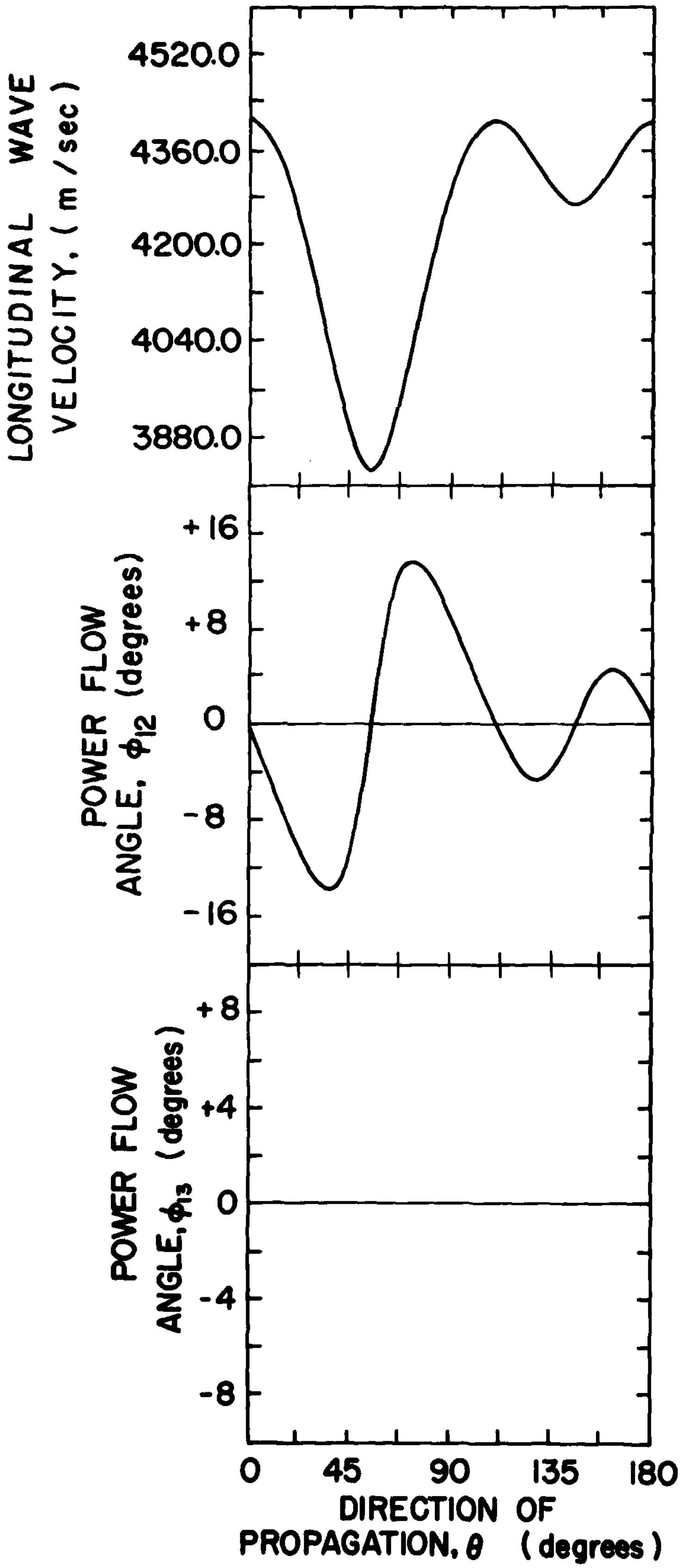


FIRST SHEAR WAVE VELOCITY, (m/sec)
2660.0
2580.0
2500.0
2420.0
2340.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
InAs
100 X $\delta v/v$
1.8×10^{-2}
1.4×10^{-2}
1.0×10^{-2}
0.6×10^{-2}
0.2×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

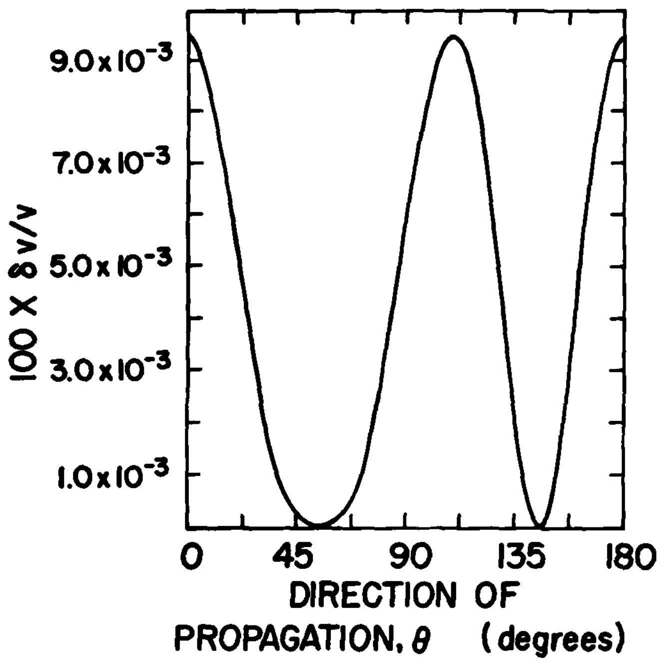


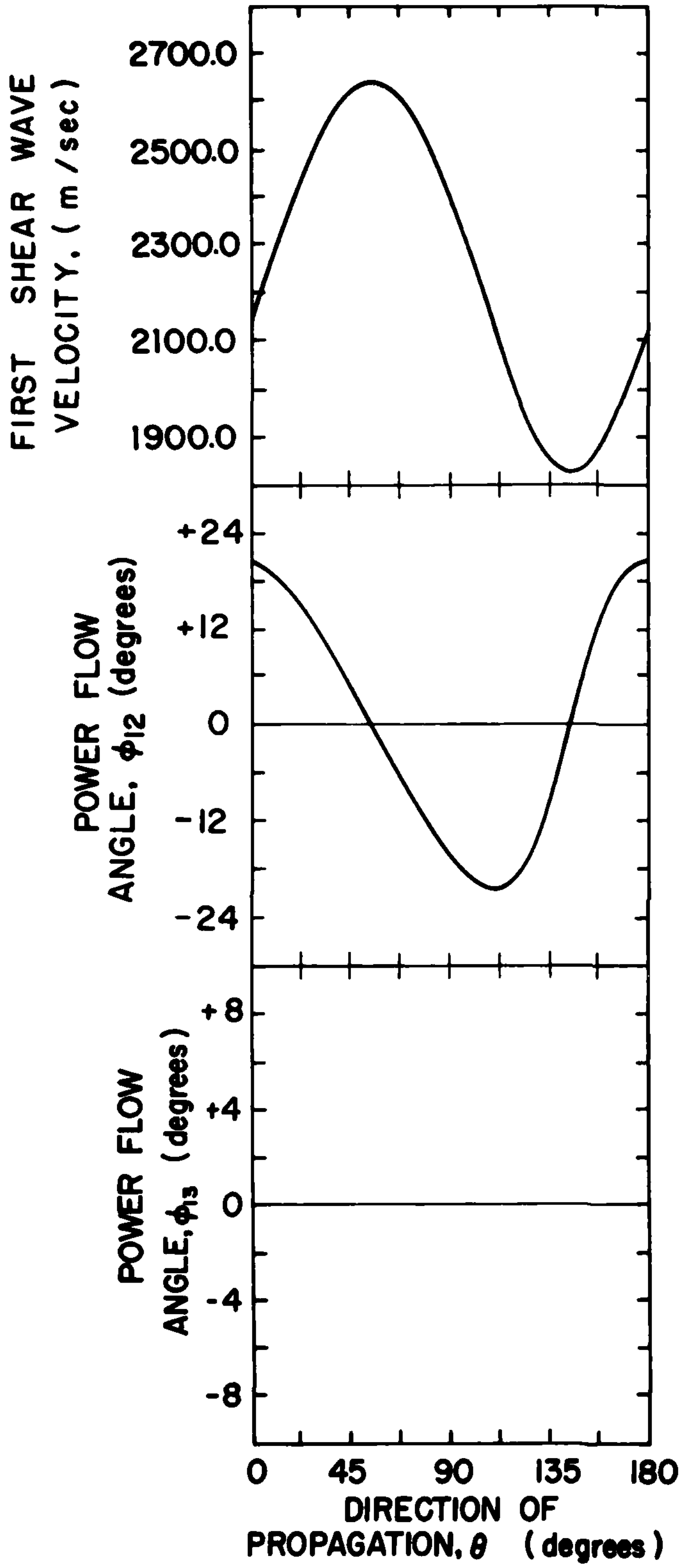
III-PLANE
InAs



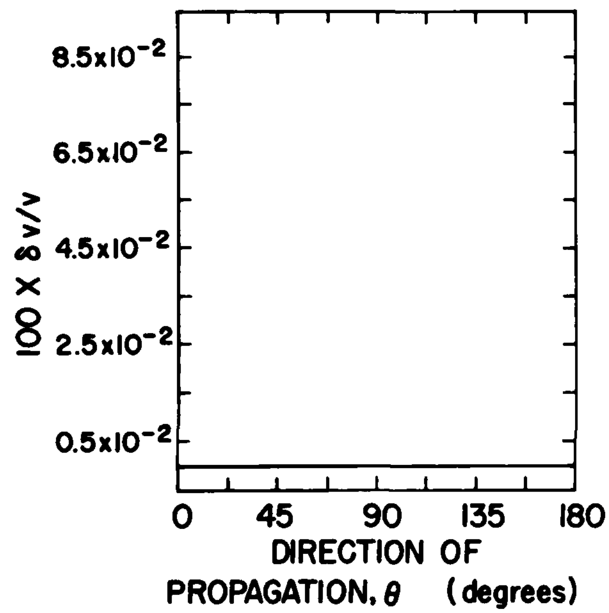


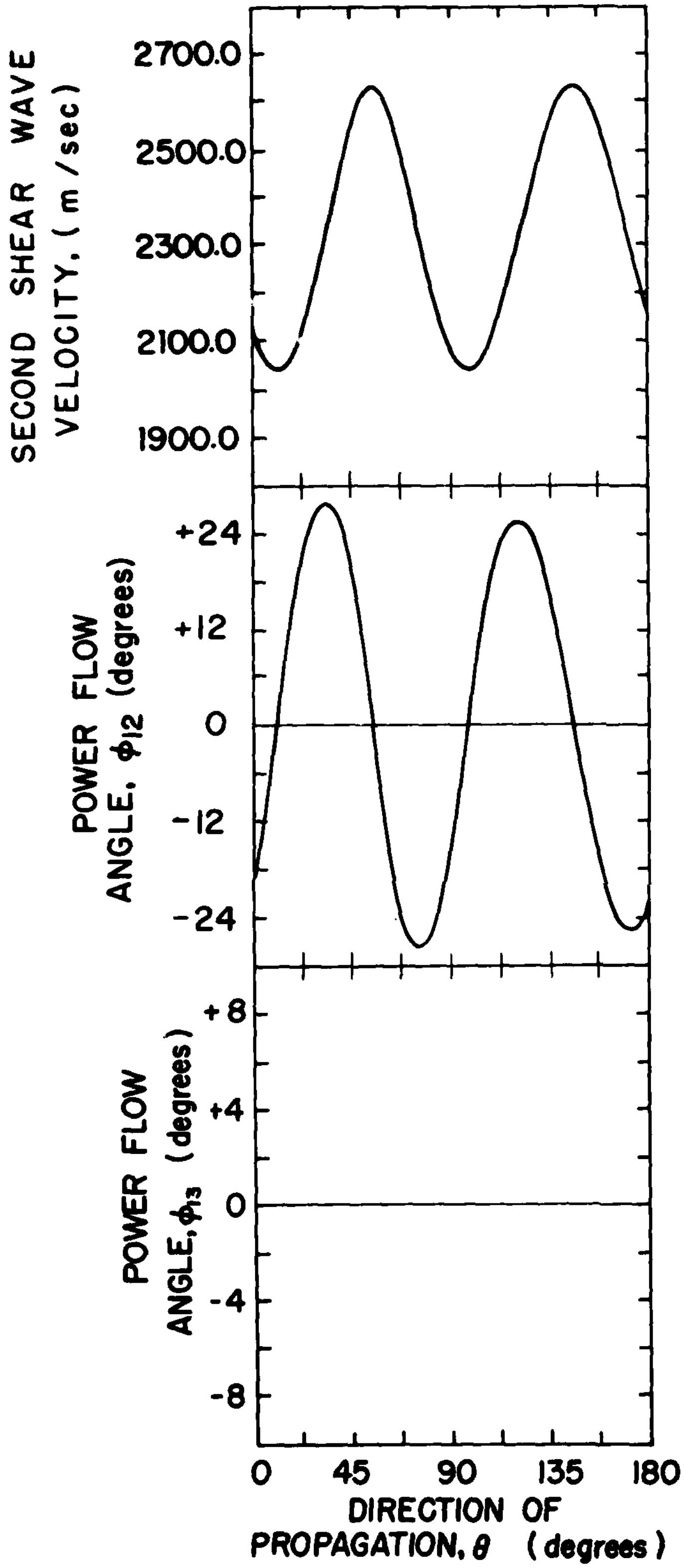
110 - PLANE
InAs



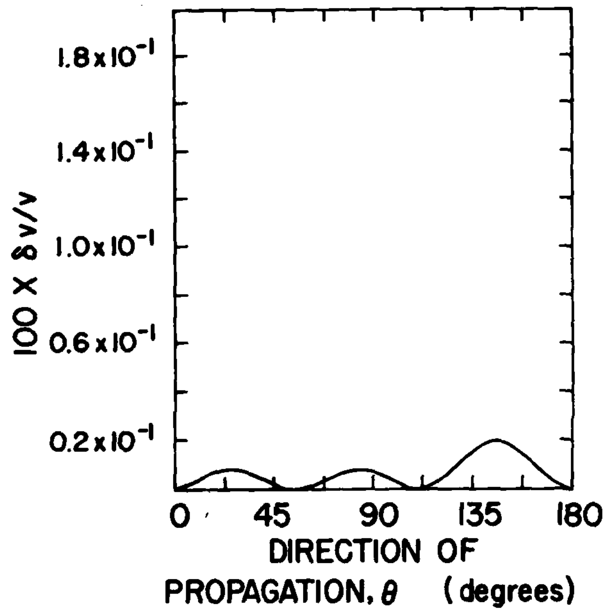


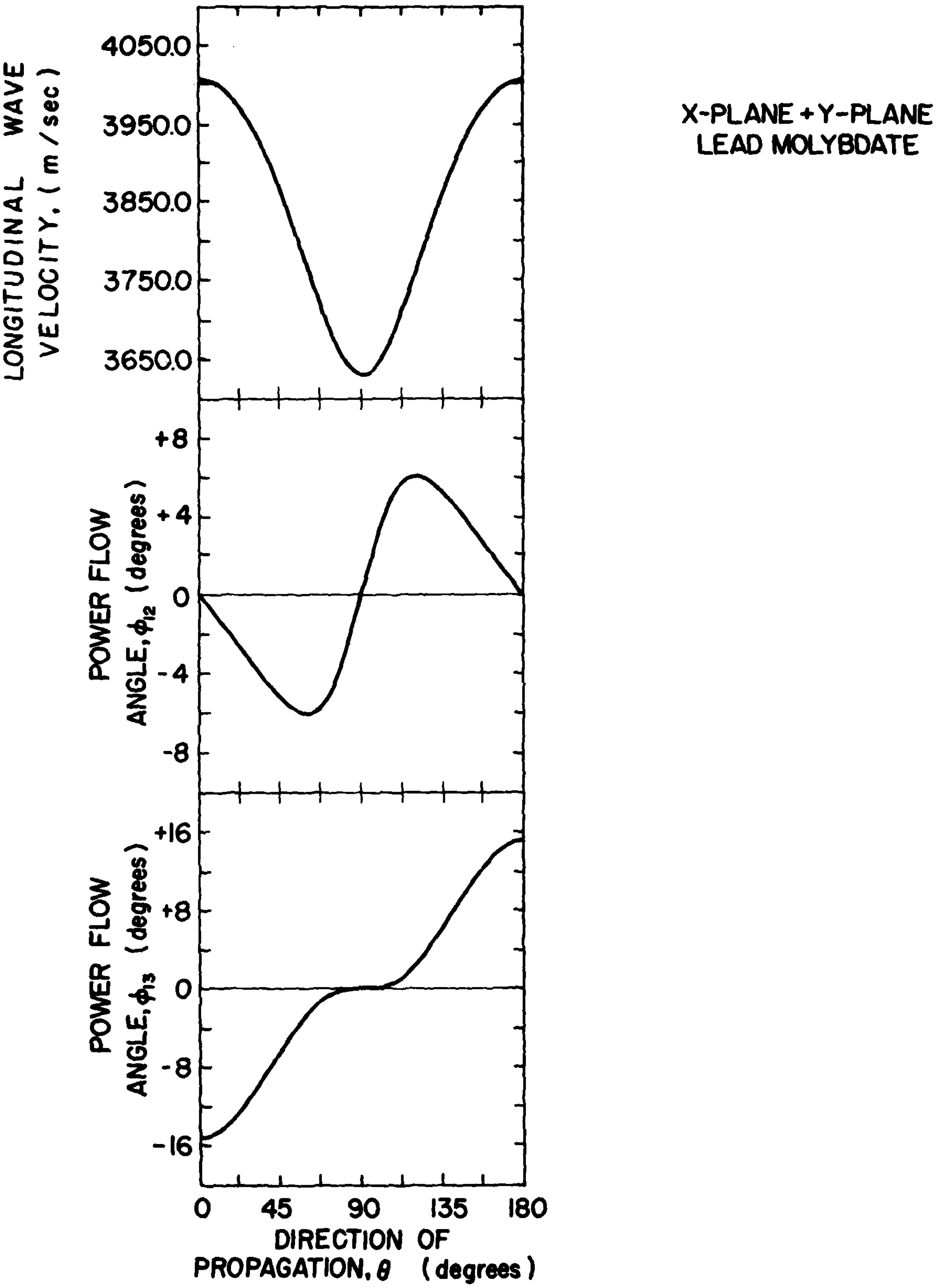
110 - PLANE
InAs

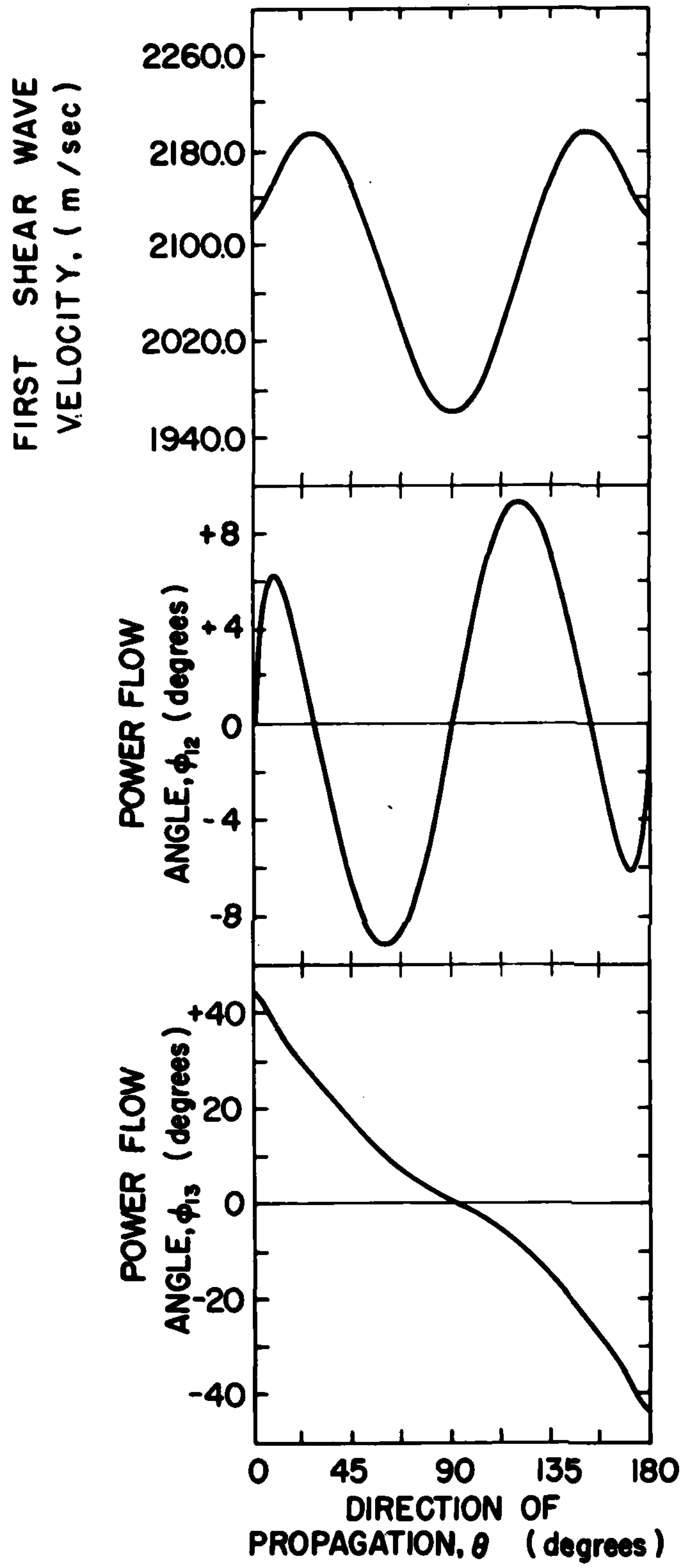




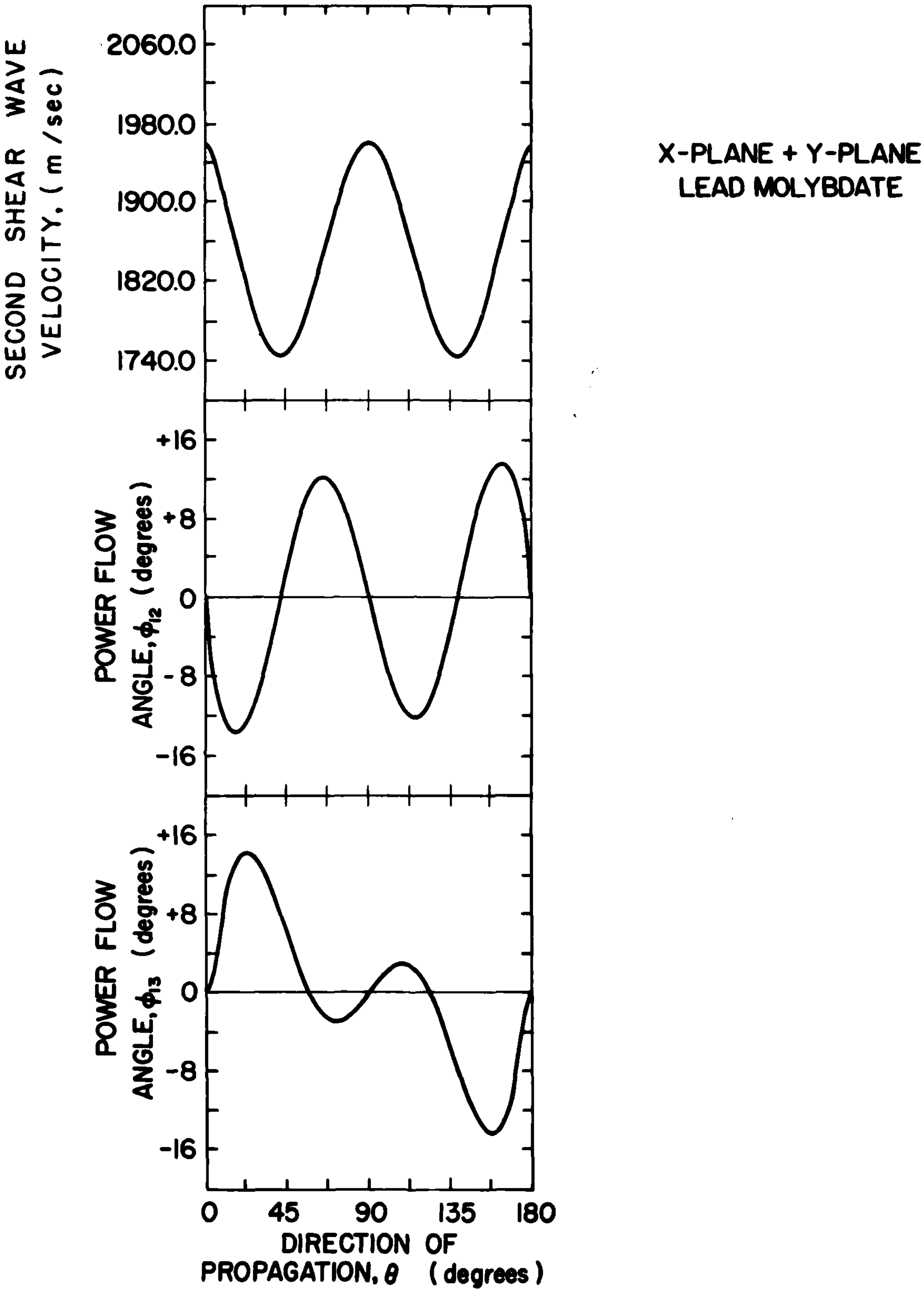
110 - PLANE
InAs



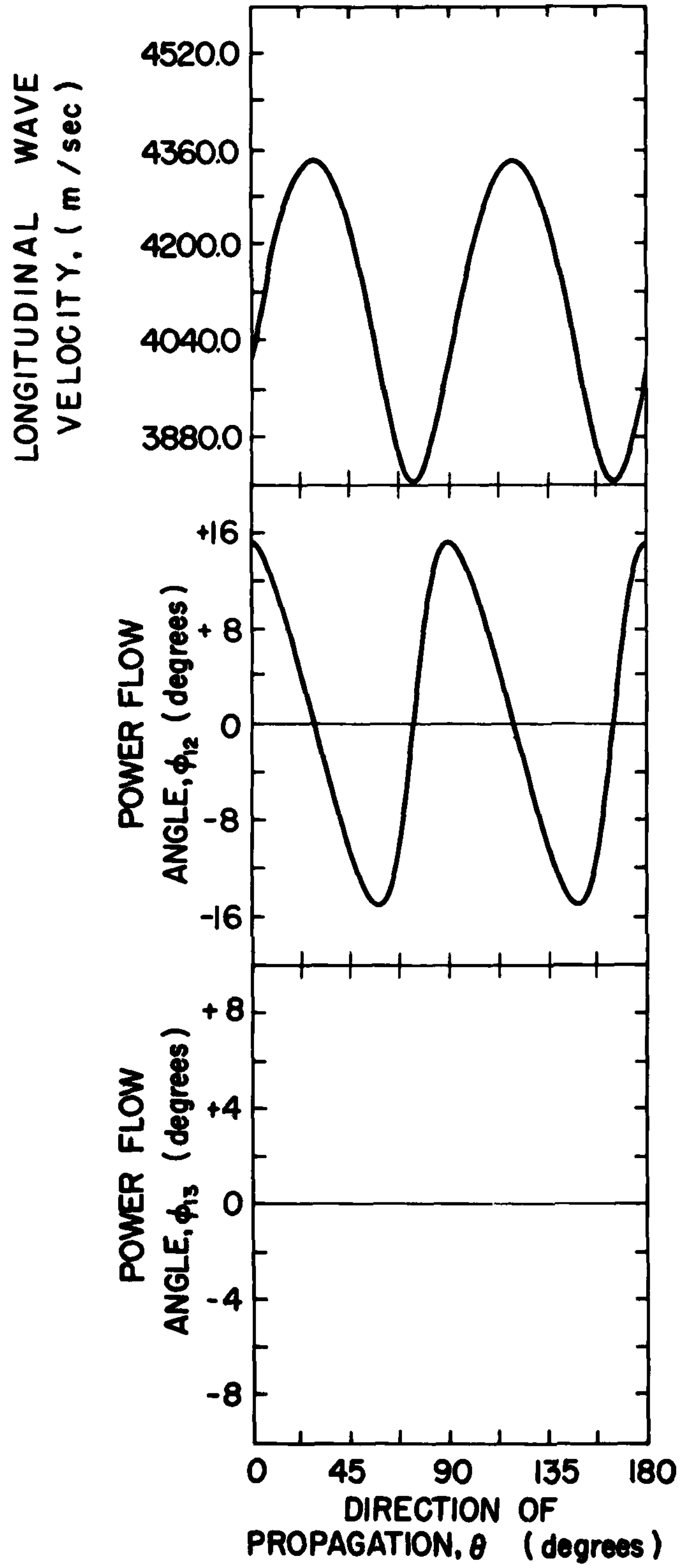

X-PLANE + Y-PLANE
LEAD MOLYBDATE
LONGITUDINAL WAVE VELOCITY, (m / sec)
4050.0
3950.0
3850.0
3750.0
3650.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



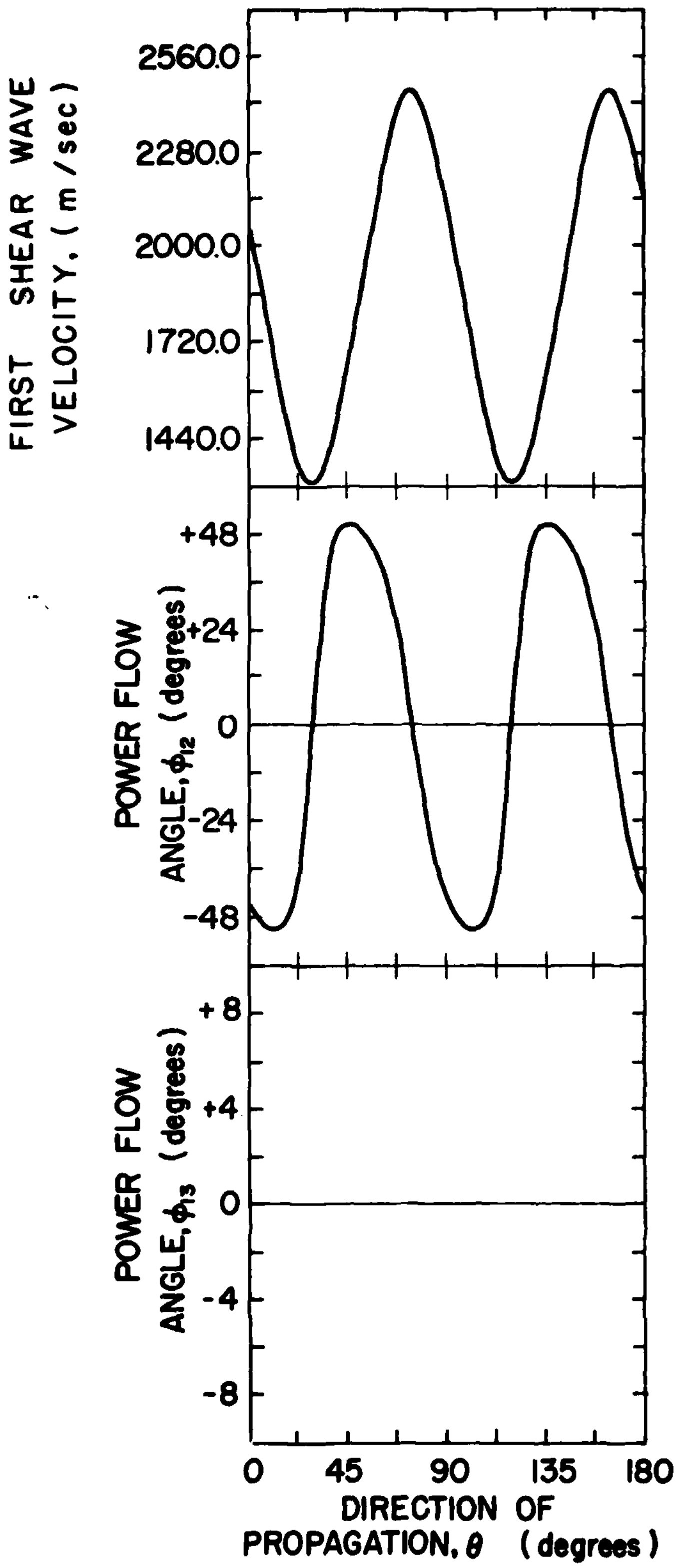
X-PLANE + Y-PLANE
LEAD MOLYBDATE



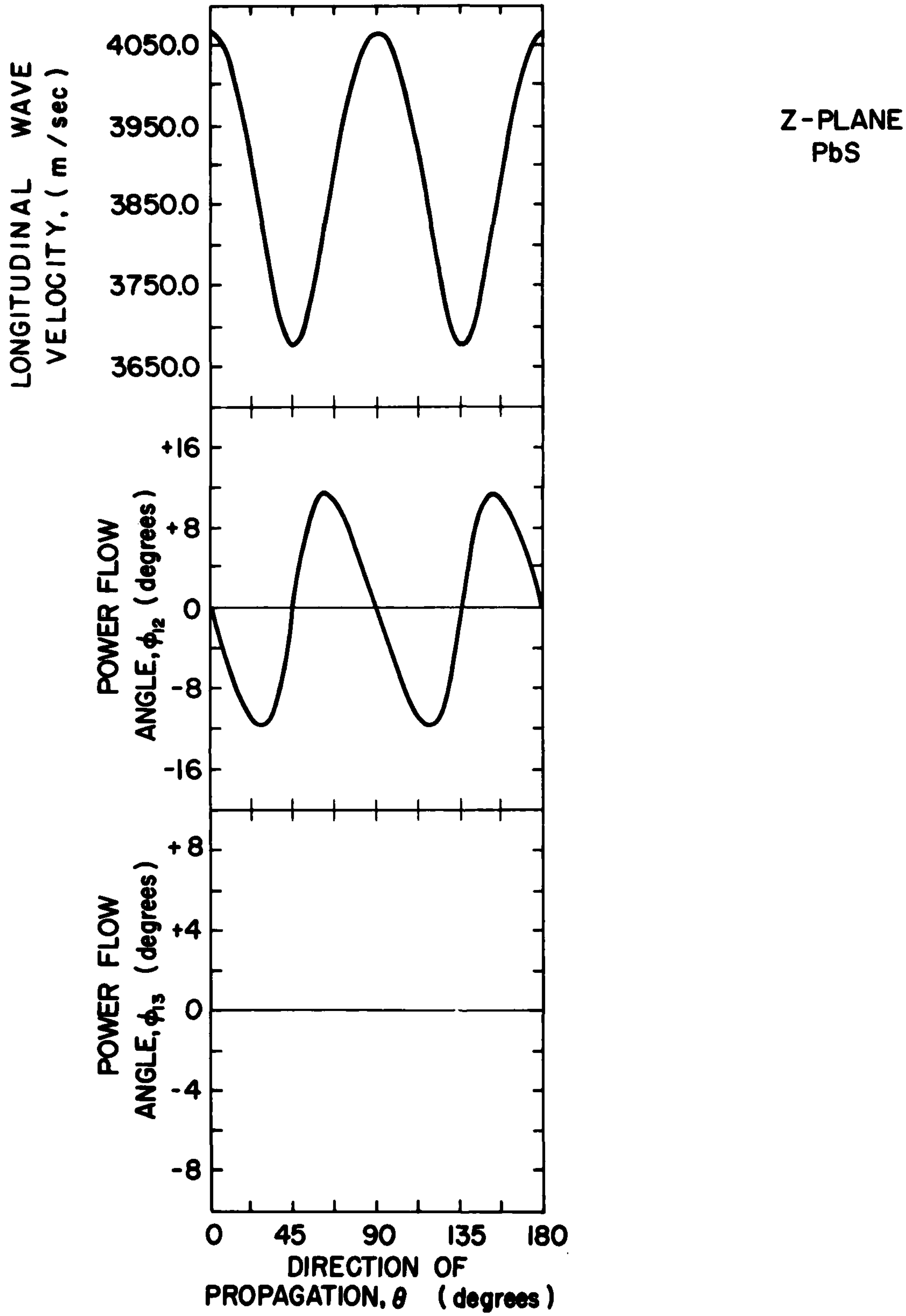
SECOND SHEAR WAVE VELOCITY, (m/sec)
2060.0
1980.0
1900.0
1820.0
1740.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
X-PLANE + Y-PLANE
LEAD MOLYBDATE

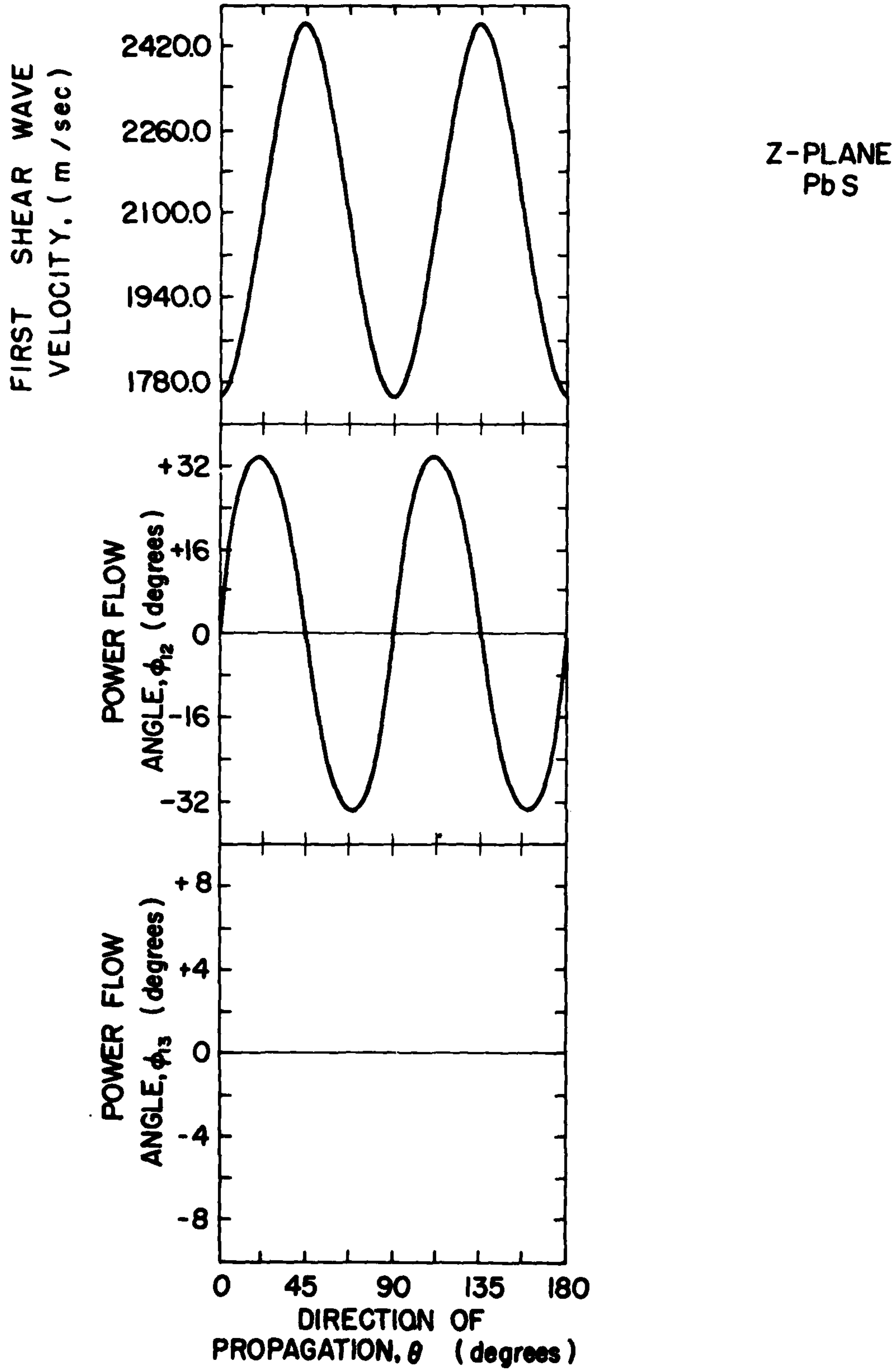


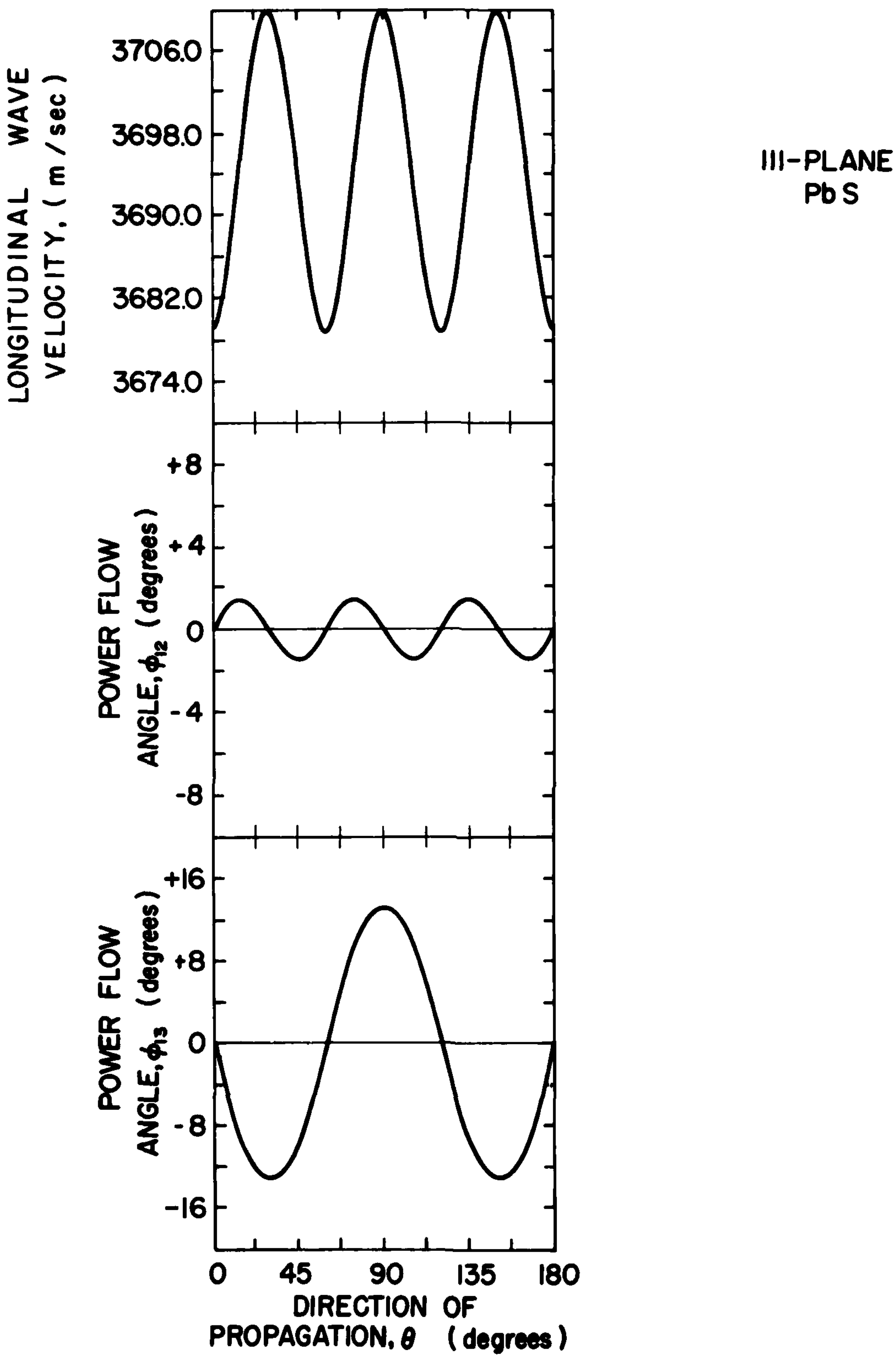
Z - PLANE
LEAD MOLYBDATE

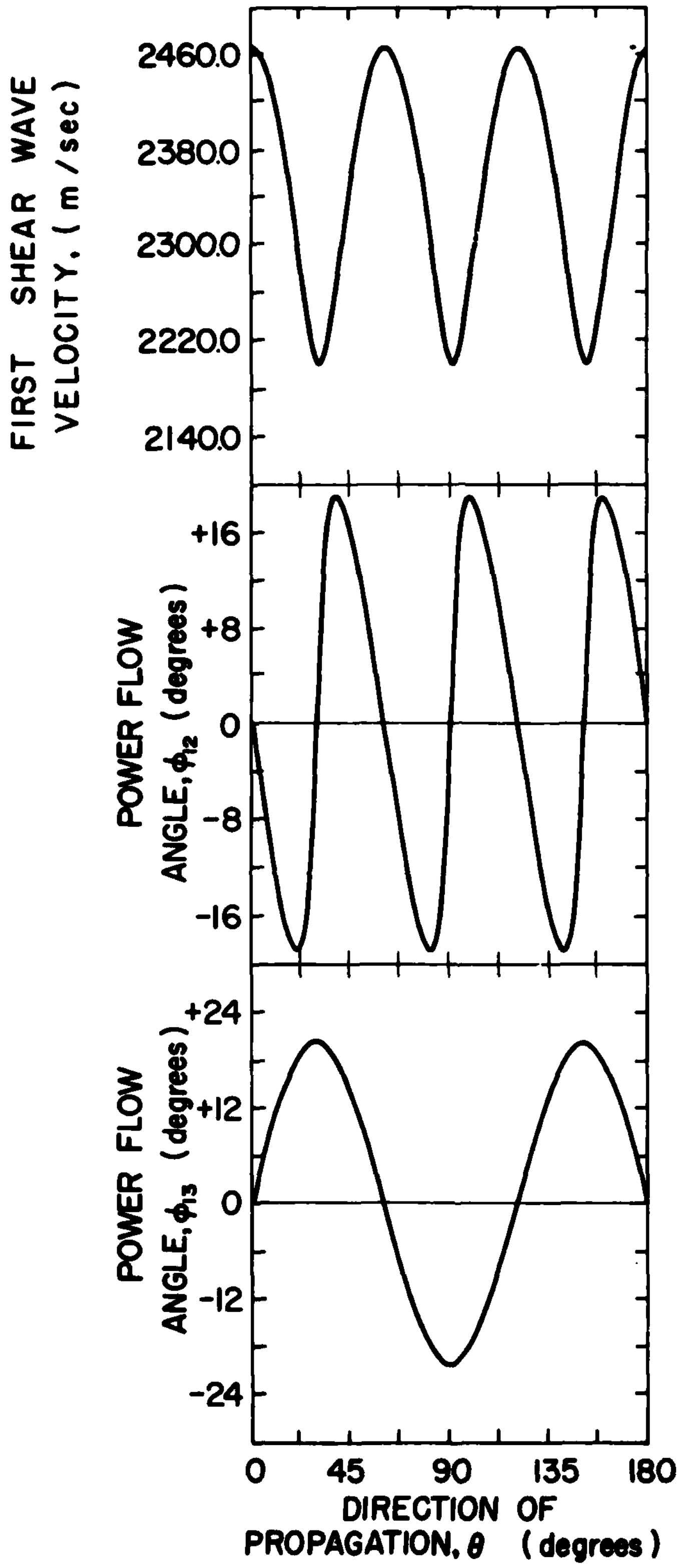


Z-PLANE
LEAD MOLYBDATE

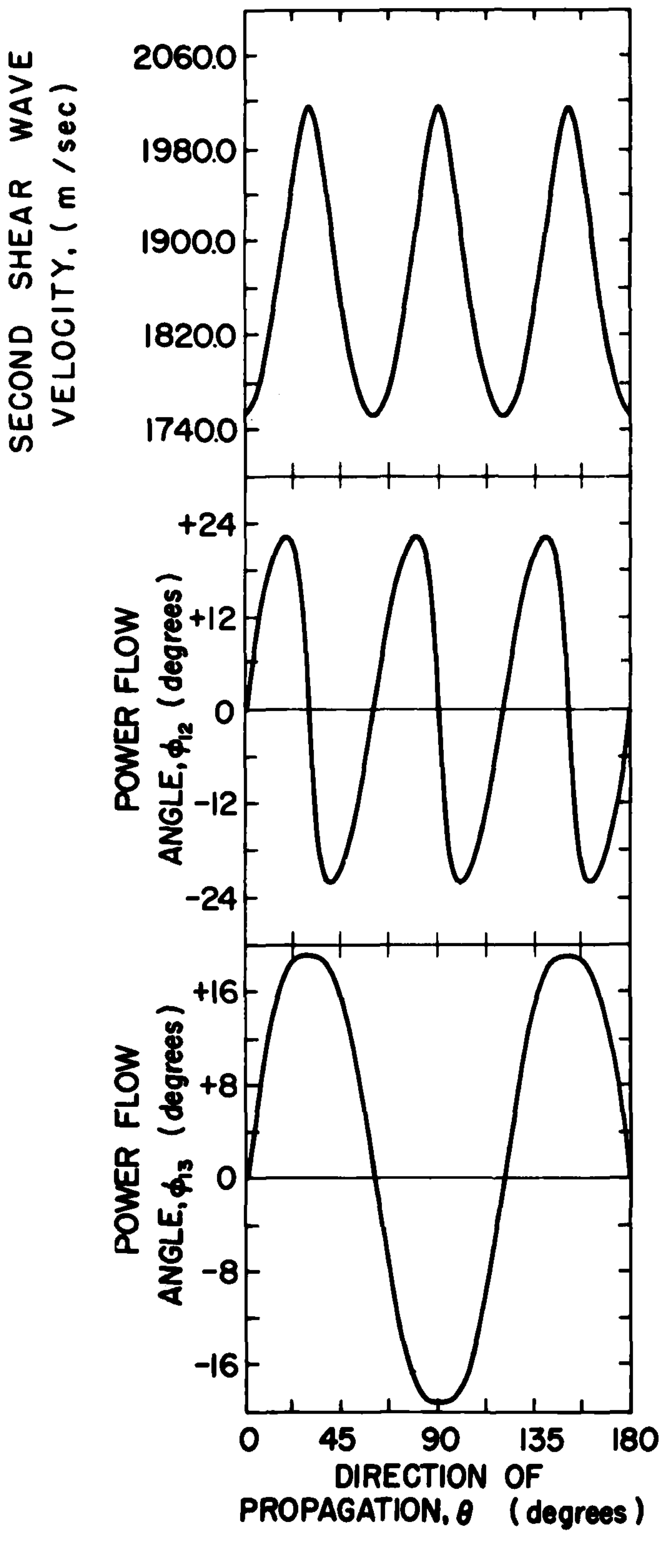

Z-PLANE
PbS
LONGITUDINAL WAVE VELOCITY, (m / sec)
4050.0
3950.0
3850.0
3750.0
3650.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


FIRST SHEAR WAVE VELOCITY, (m/sec)
2420.0
2260.0
2100.0
1940.0
1780.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+32
+16
0
-16
-32
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
PbS

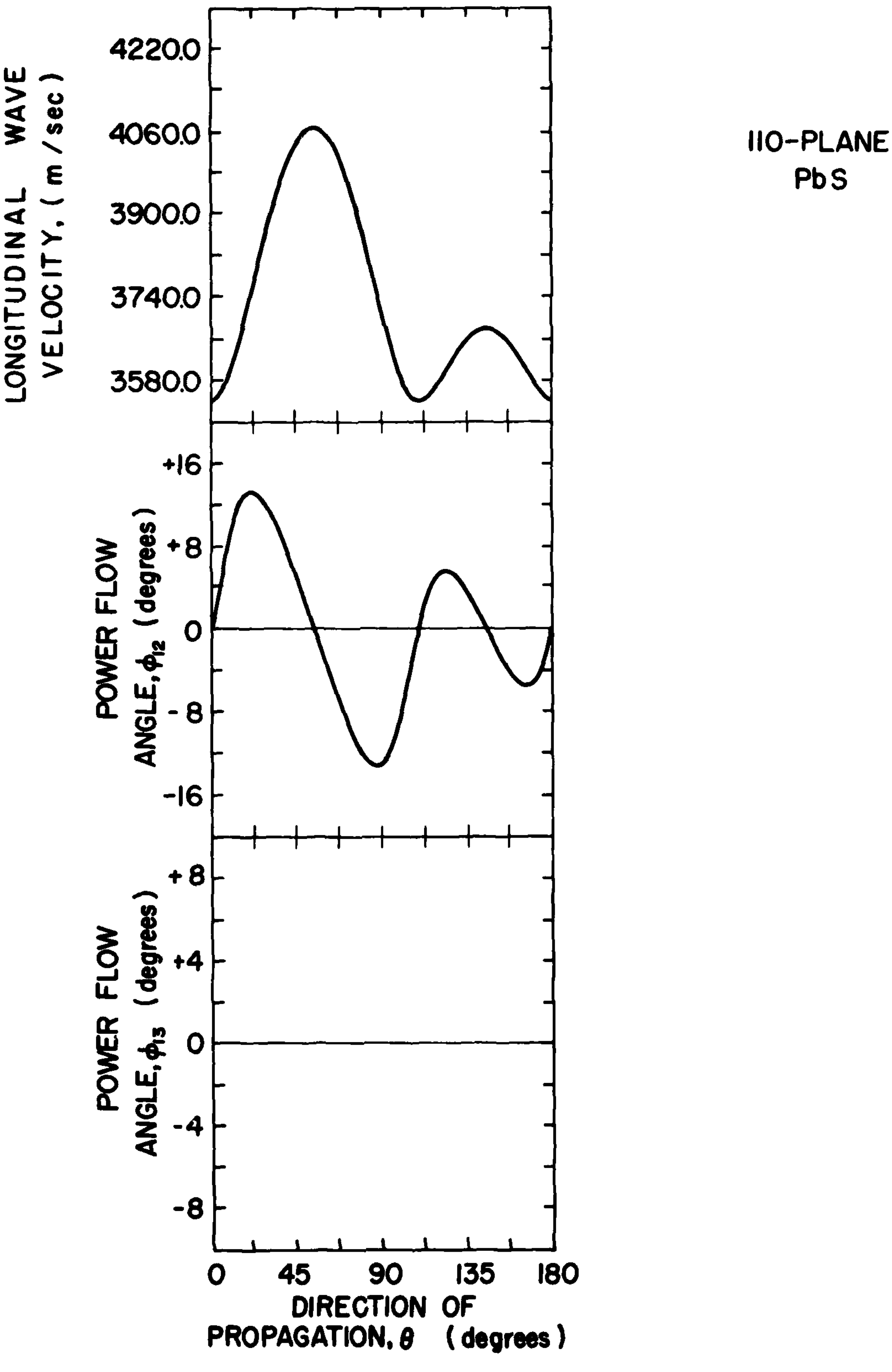

LONGITUDINAL WAVE VELOCITY, (m / sec)
3706.0
3698.0
3690.0
3682.0
3674.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
III-PLANE
PbS

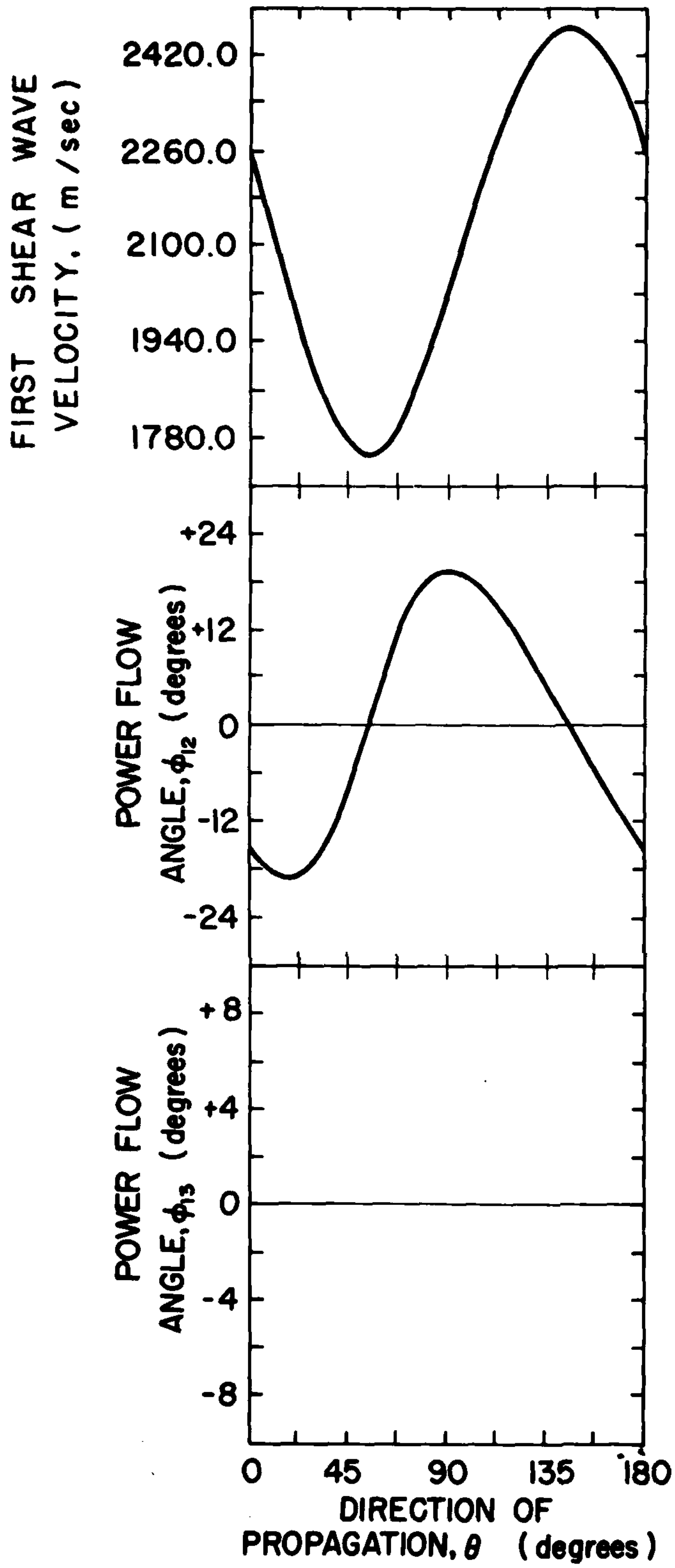


111-PLANE
PbS

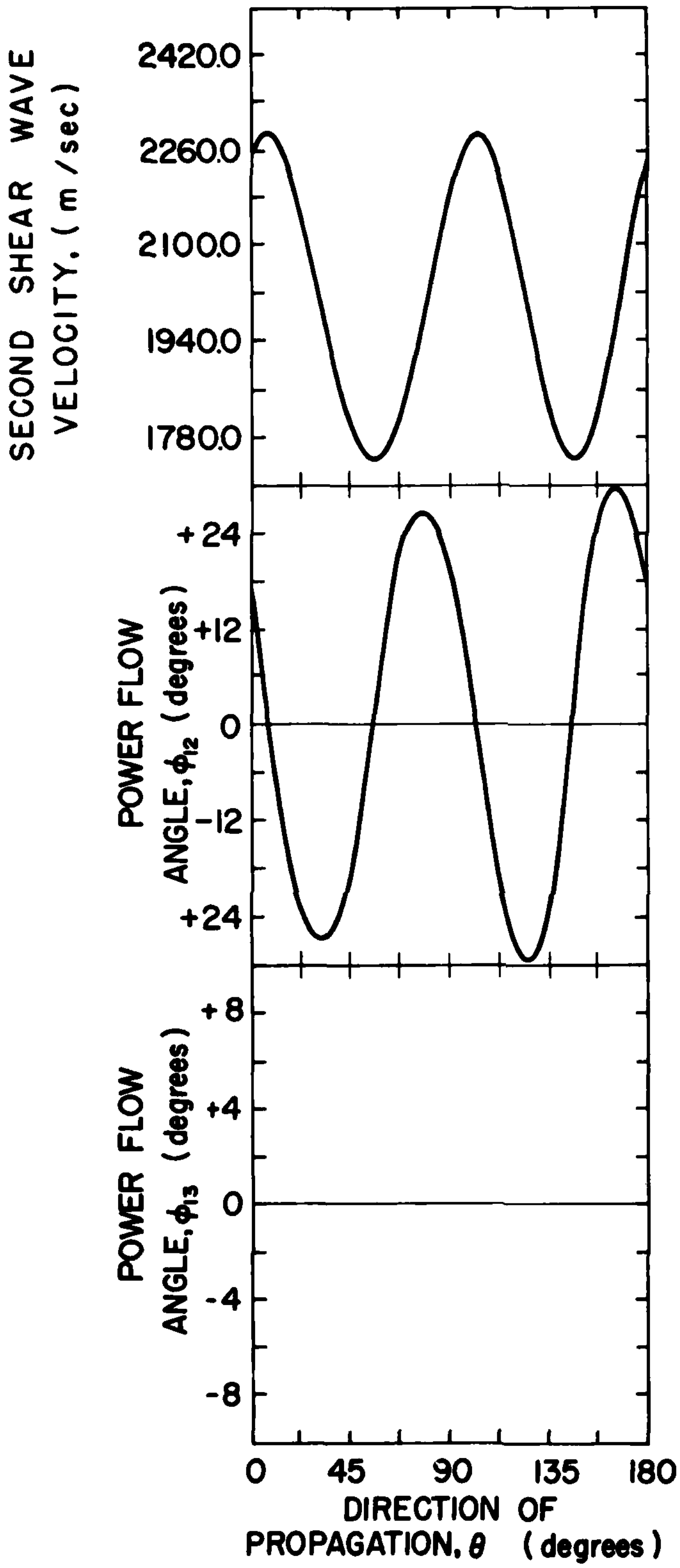


111-PLANE
PbS

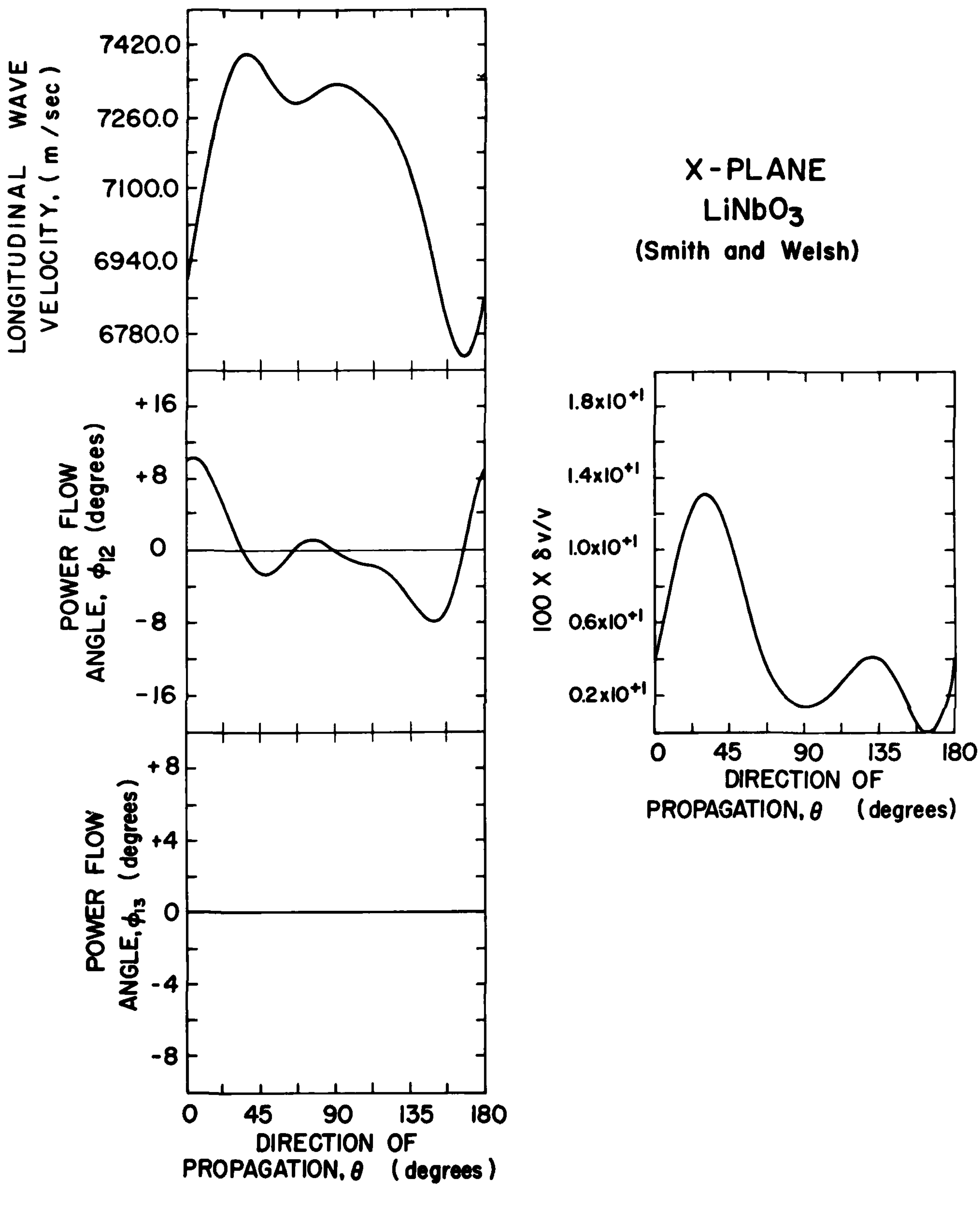

110-PLANE
PbS
LONGITUDINAL WAVE VELOCITY, (m / sec)
4220.0
4060.0
3900.0
3740.0
3580.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



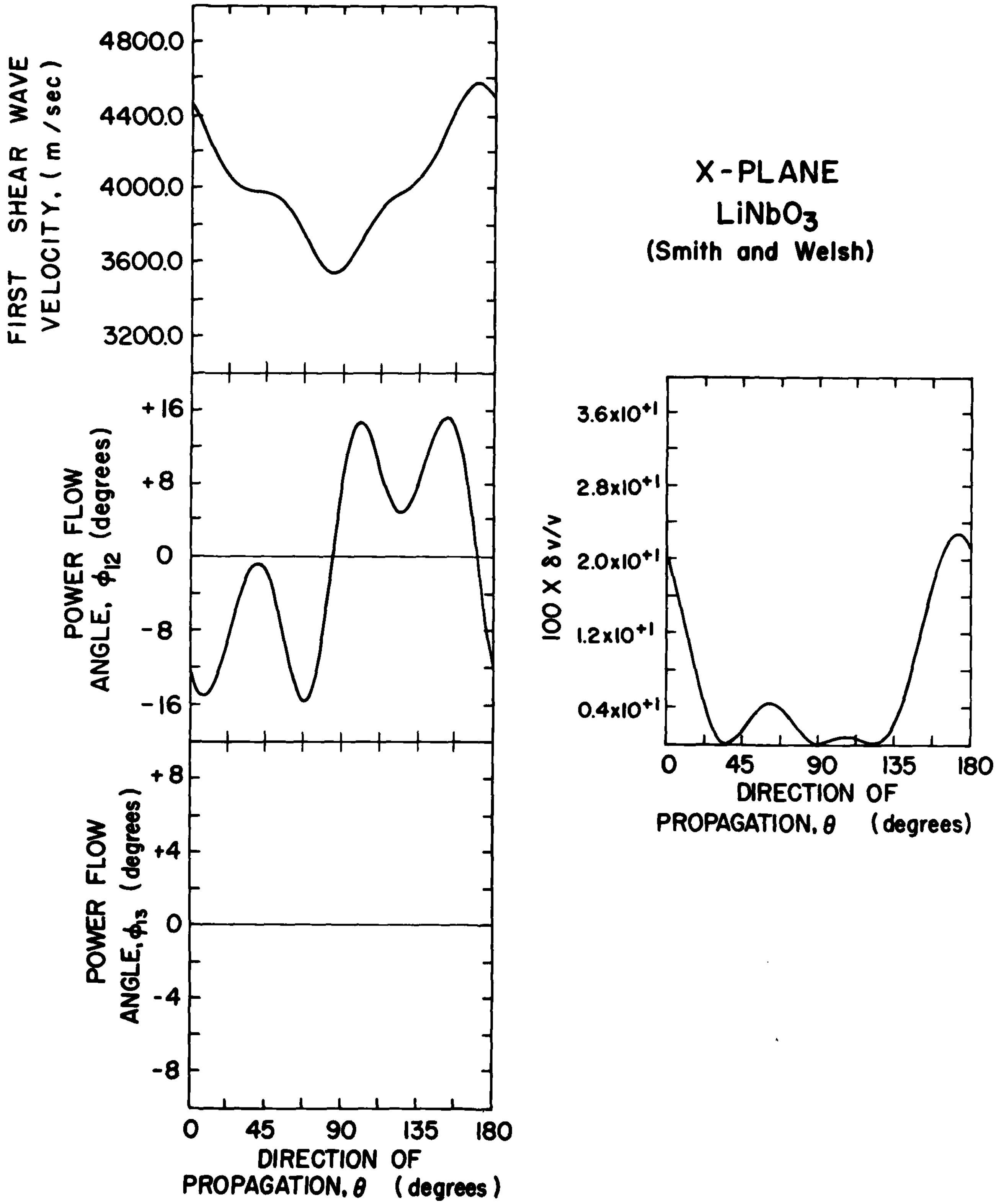
110-PLANE
PbS

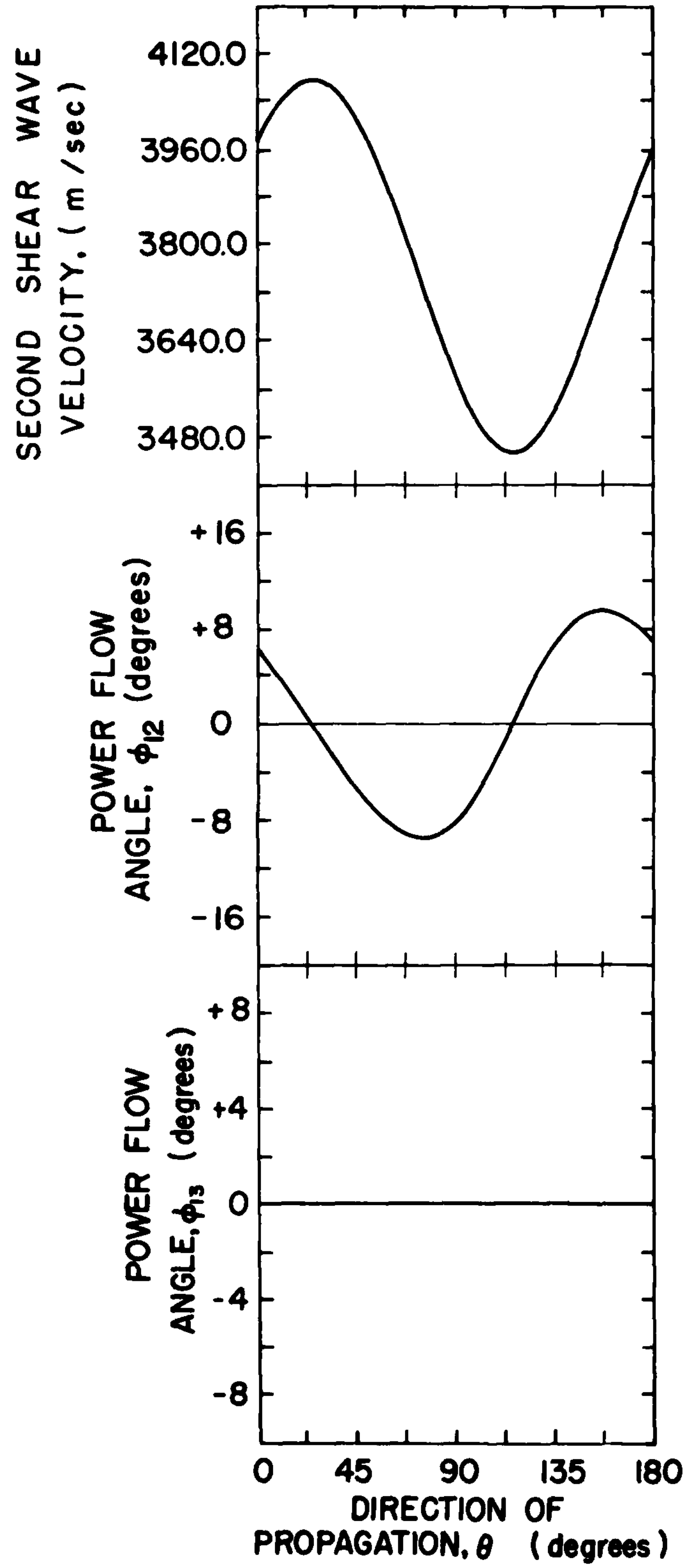


110-PLANE
PbS

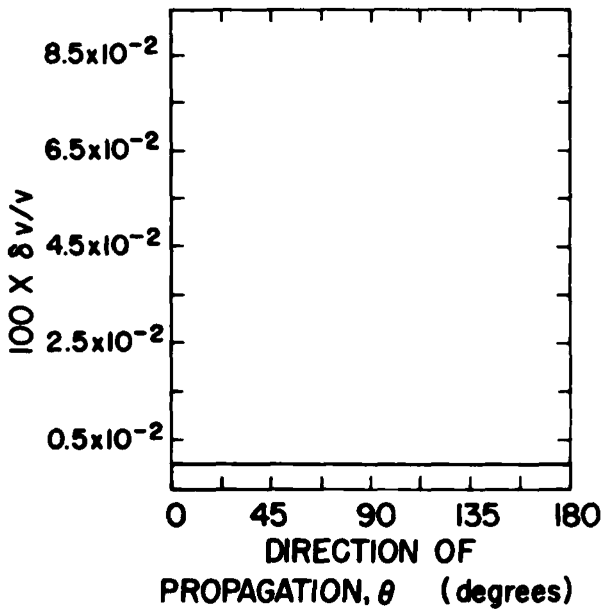


X-PLANE
LiNbO3
(Smith and Welsh)
LONGITUDINAL WAVE VELOCITY, (m / sec)
7420.0
7260.0
7100.0
6940.0
6780.0
POWER FLOW ANGLE, φ12 (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, φ13 (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X δv/v
1.8x10+1
1.4x10+1
1.0x10+1
0.6x10+1
0.2x10+1
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

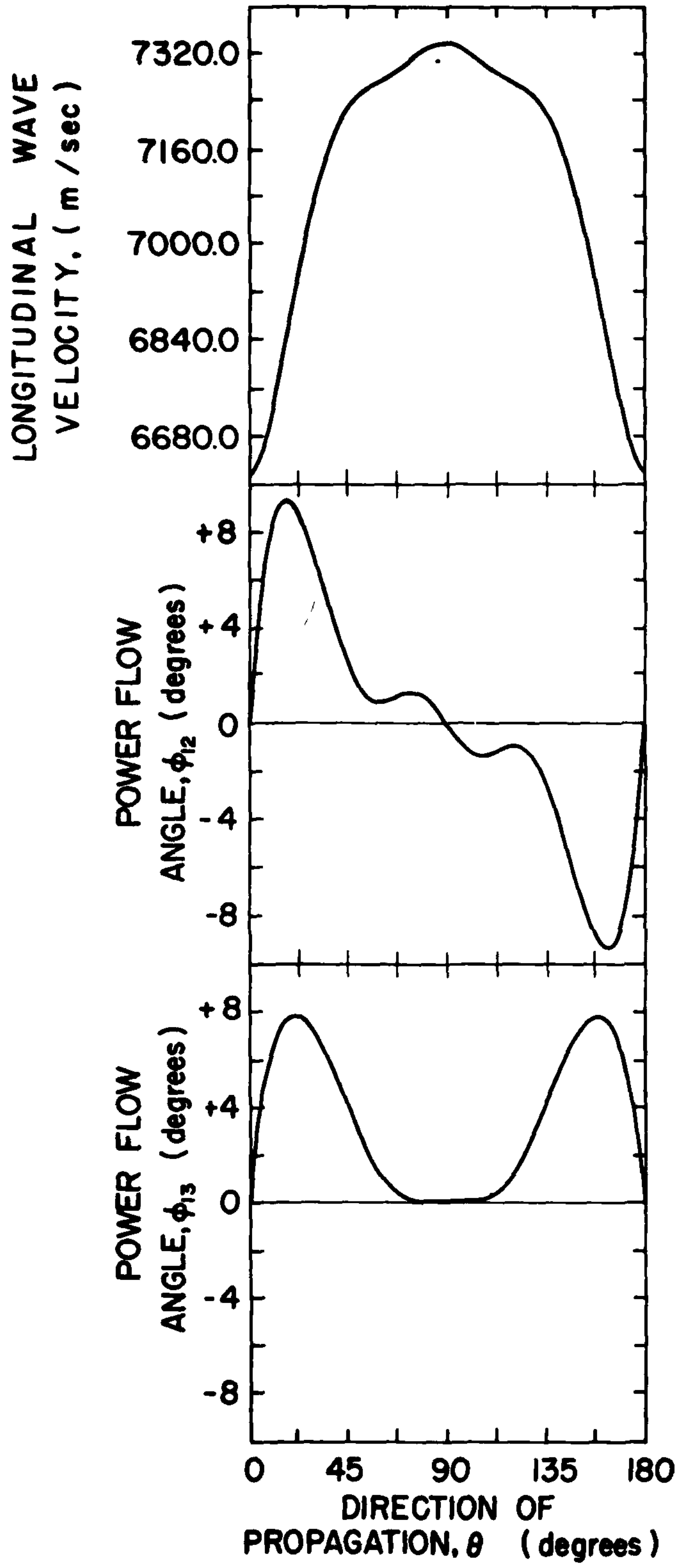

X-PLANE
$LiNbO_3$
(Smith and Welsh)
FIRST SHEAR WAVE VELOCITY, (m/sec)
4800.0
4400.0
4000.0
3600.0
3200.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
$3.6 \times 10^{+1}$
$2.8 \times 10^{+1}$
$2.0 \times 10^{+1}$
$1.2 \times 10^{+1}$
$0.4 \times 10^{+1}$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

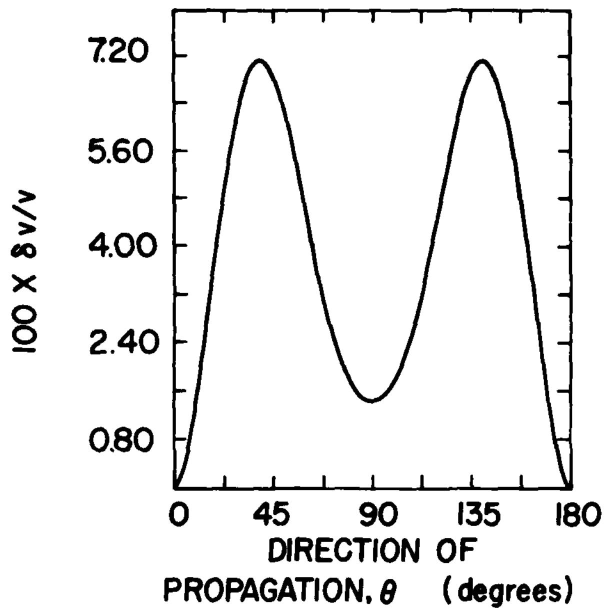


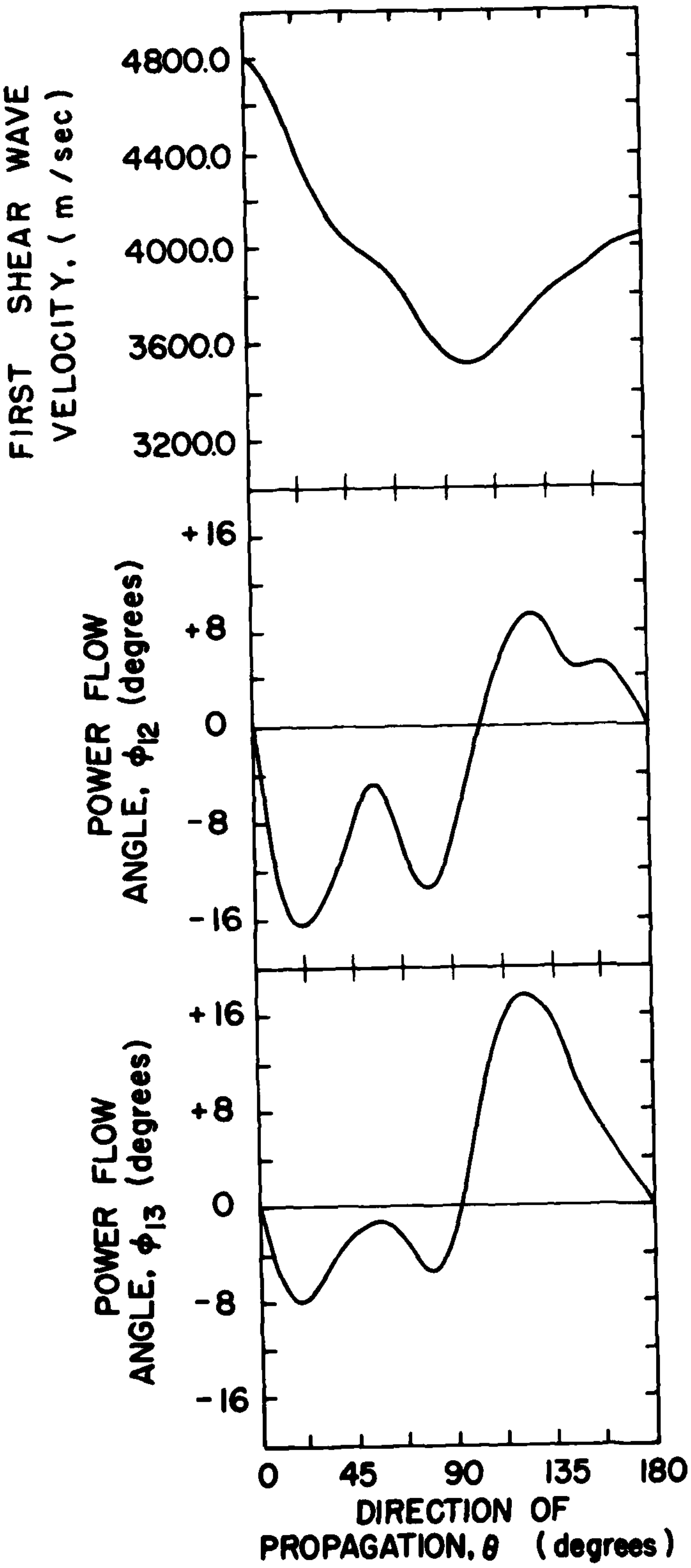
X-PLANE
$LiNbO_3$
(Smith and Welsh)



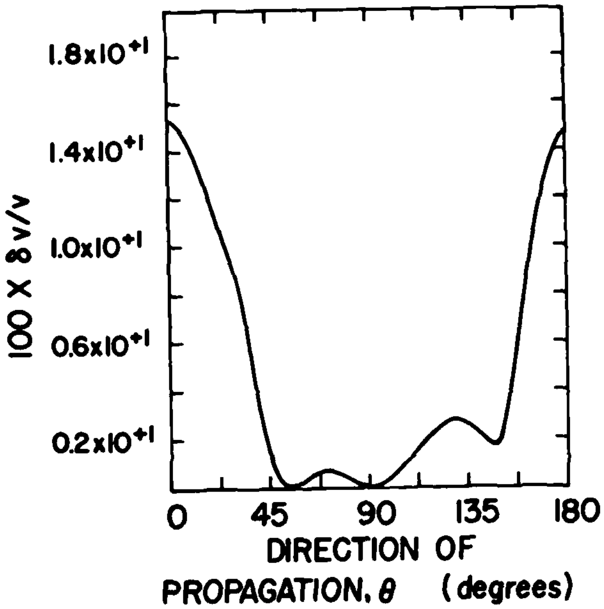
Y-PLANE
$LiNbO_3$
(Smith and Welsh)

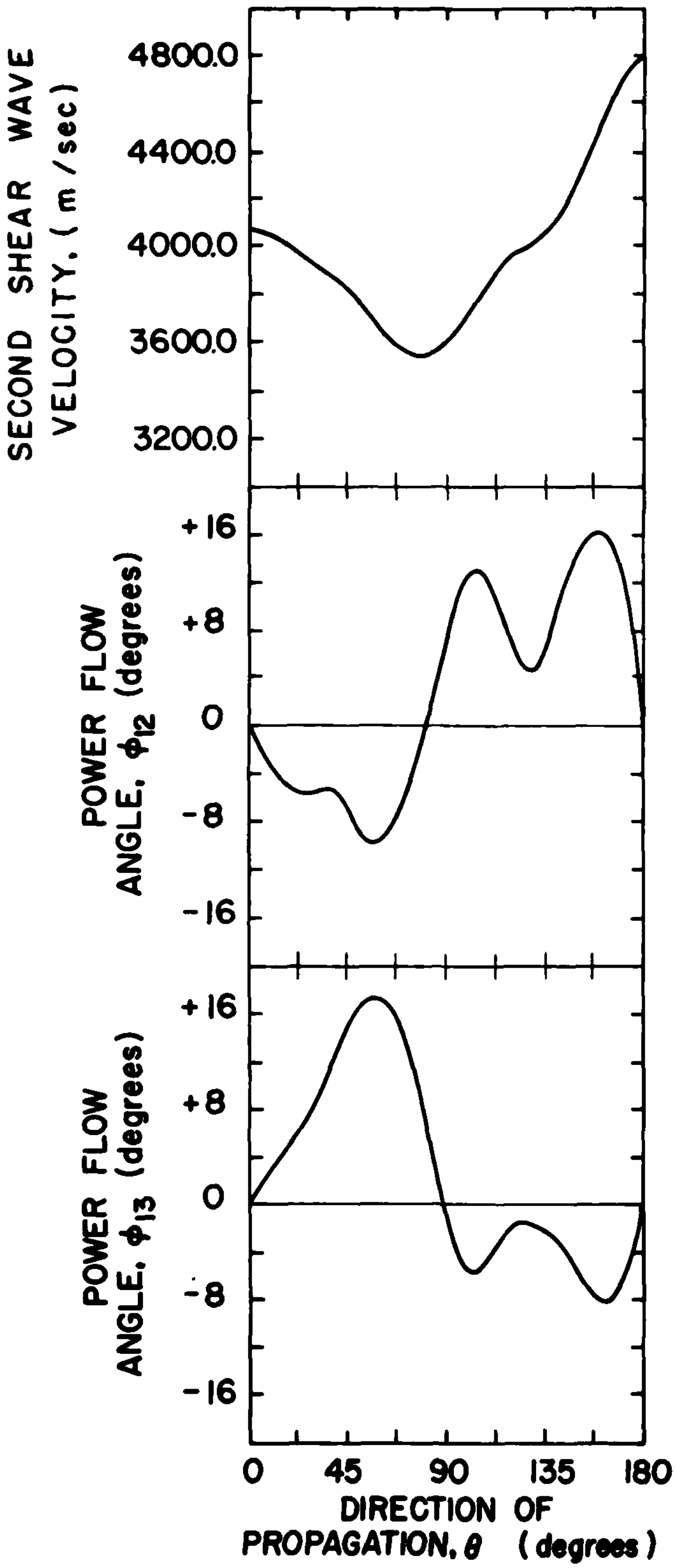






Y-PLANE
$LiNbO_3$
(Smith and Welsh)

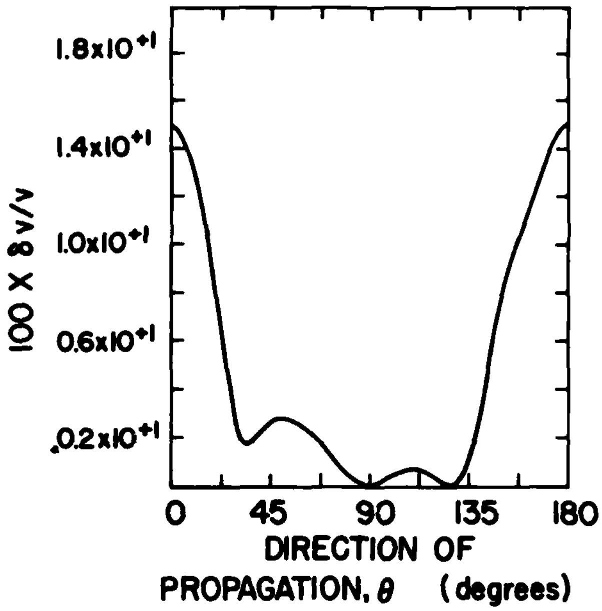


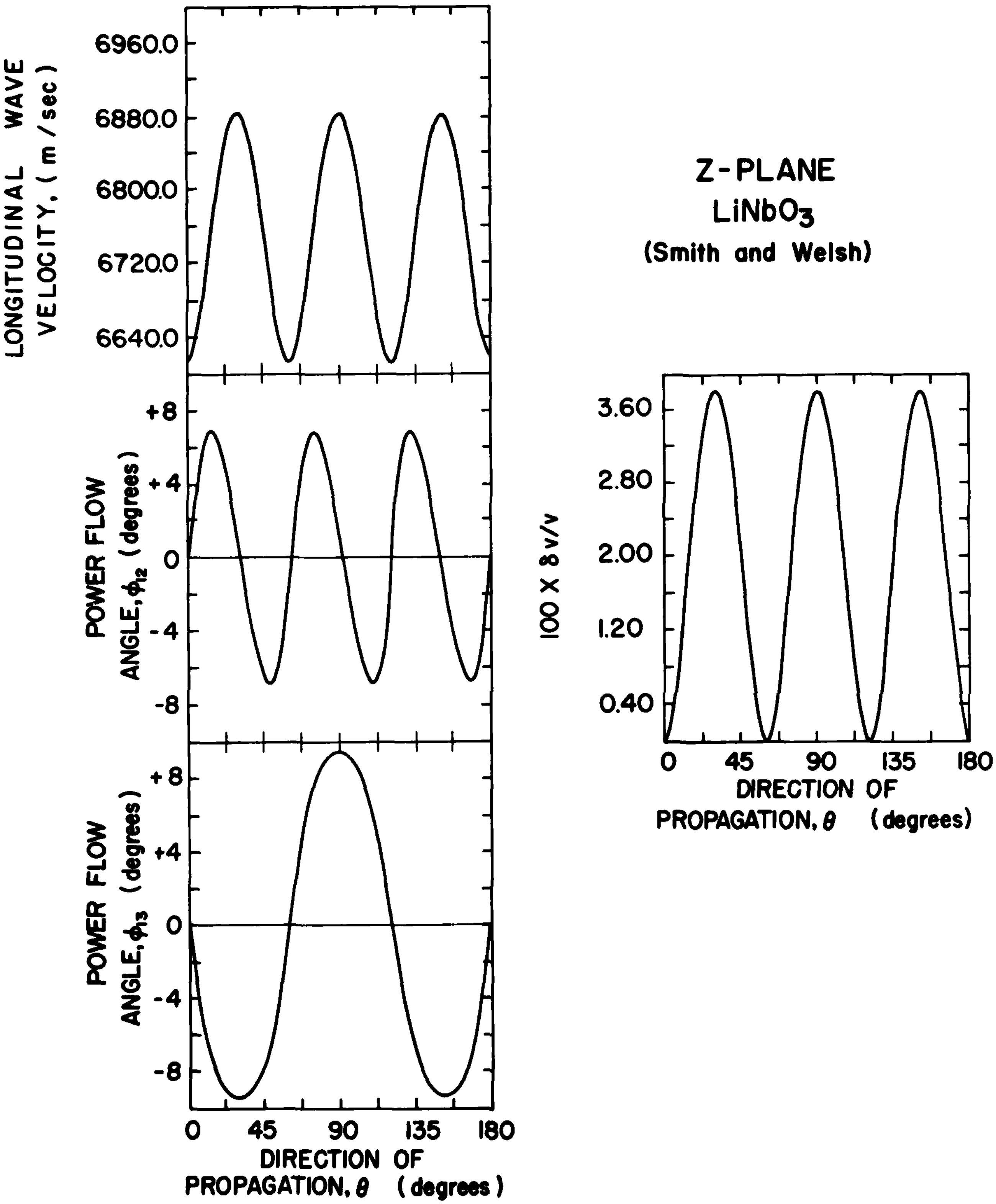


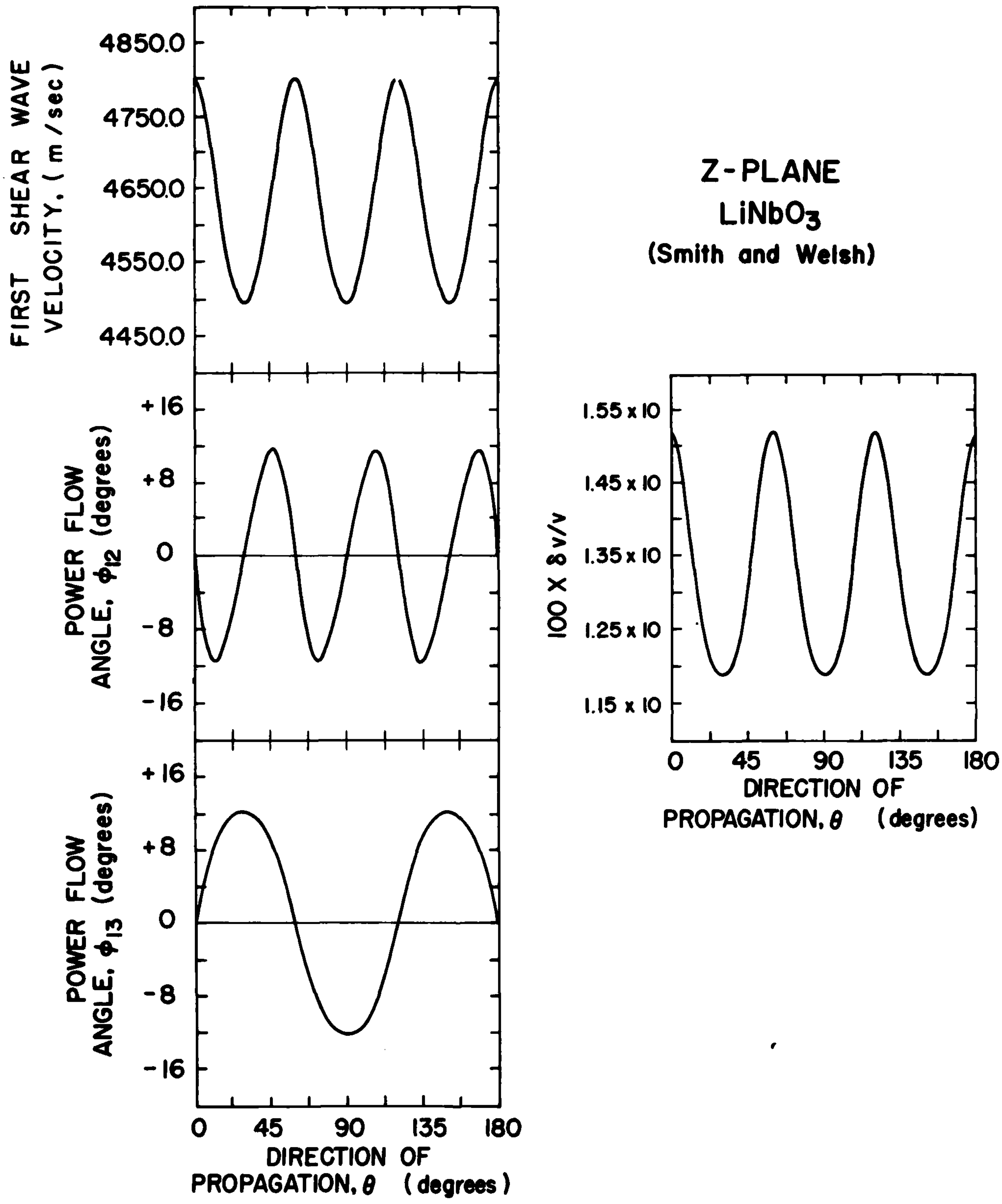
Y-PLANE

$LiNbO_3$

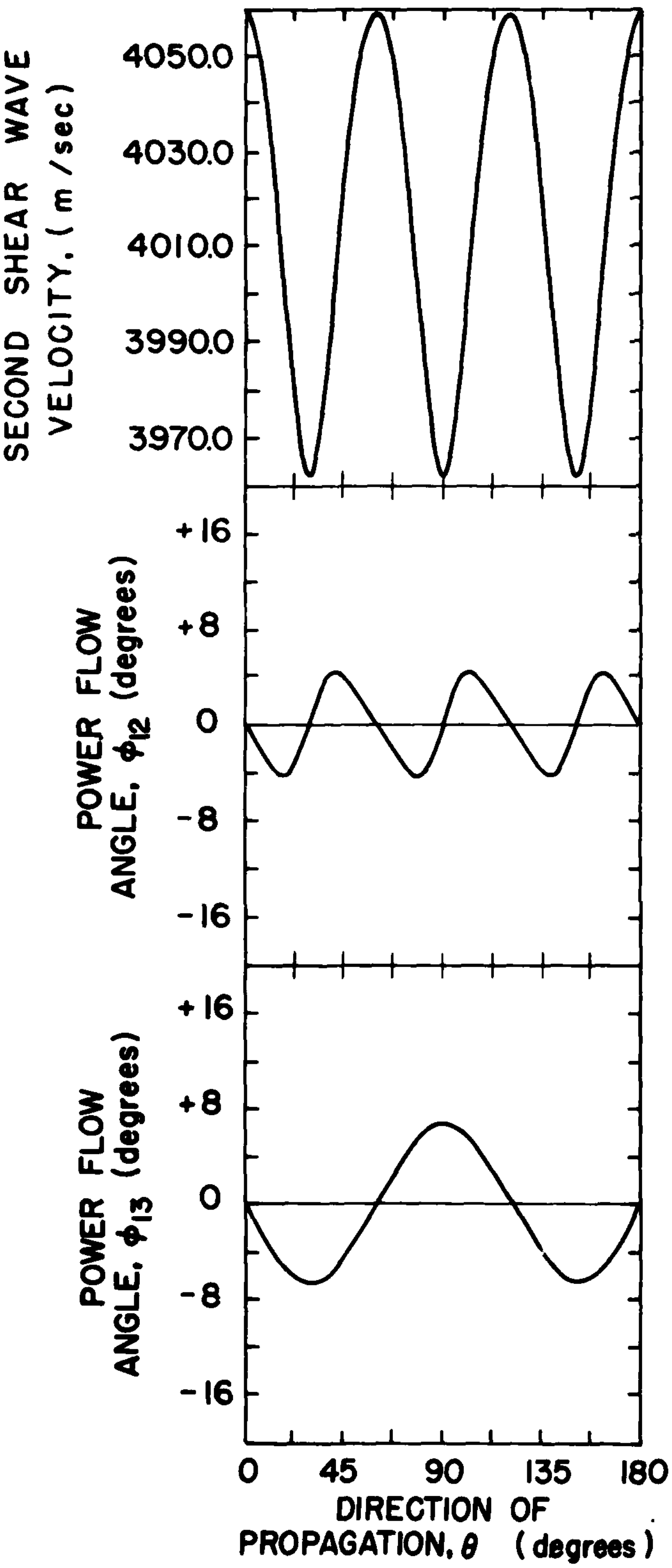
(Smith and Welsh)

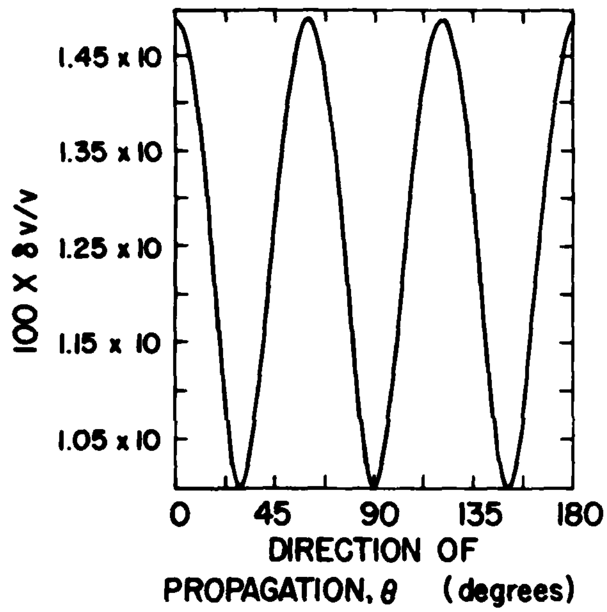


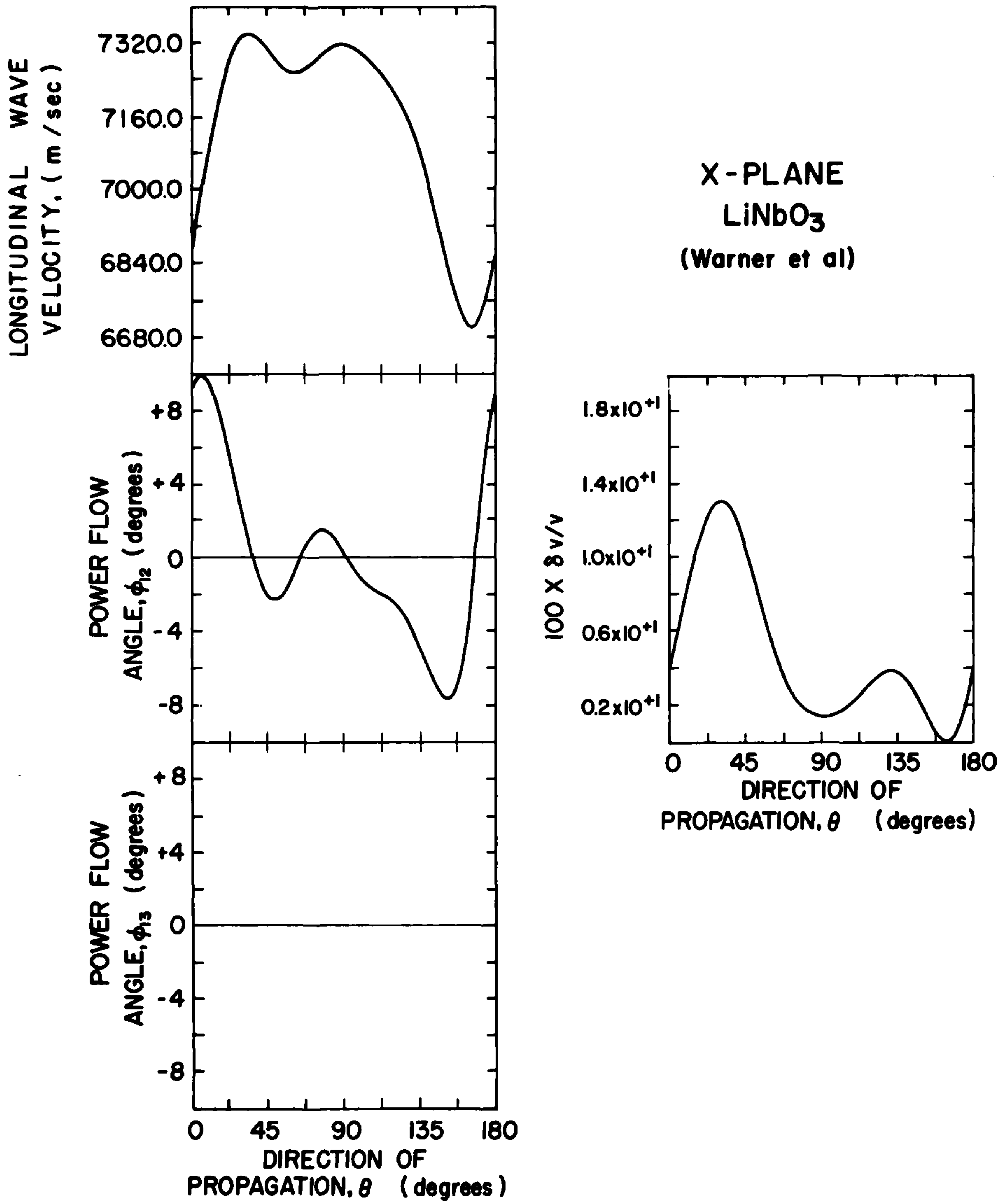

Z-PLANE
$LiNbO_3$
(Smith and Welsh)
LONGITUDINAL WAVE VELOCITY, (m / sec)
6960.0
6880.0
6800.0
6720.0
6640.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
3.60
2.80
2.00
1.20
0.40
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


FIRST SHEAR WAVE VELOCITY, (m/sec)
4850.0
4750.0
4650.0
4550.0
4450.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
$LiNbO_3$
(Smith and Welsh)
$100 \times \delta v/v$
1.55 x 10
1.45 x 10
1.35 x 10
1.25 x 10
1.15 x 10
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

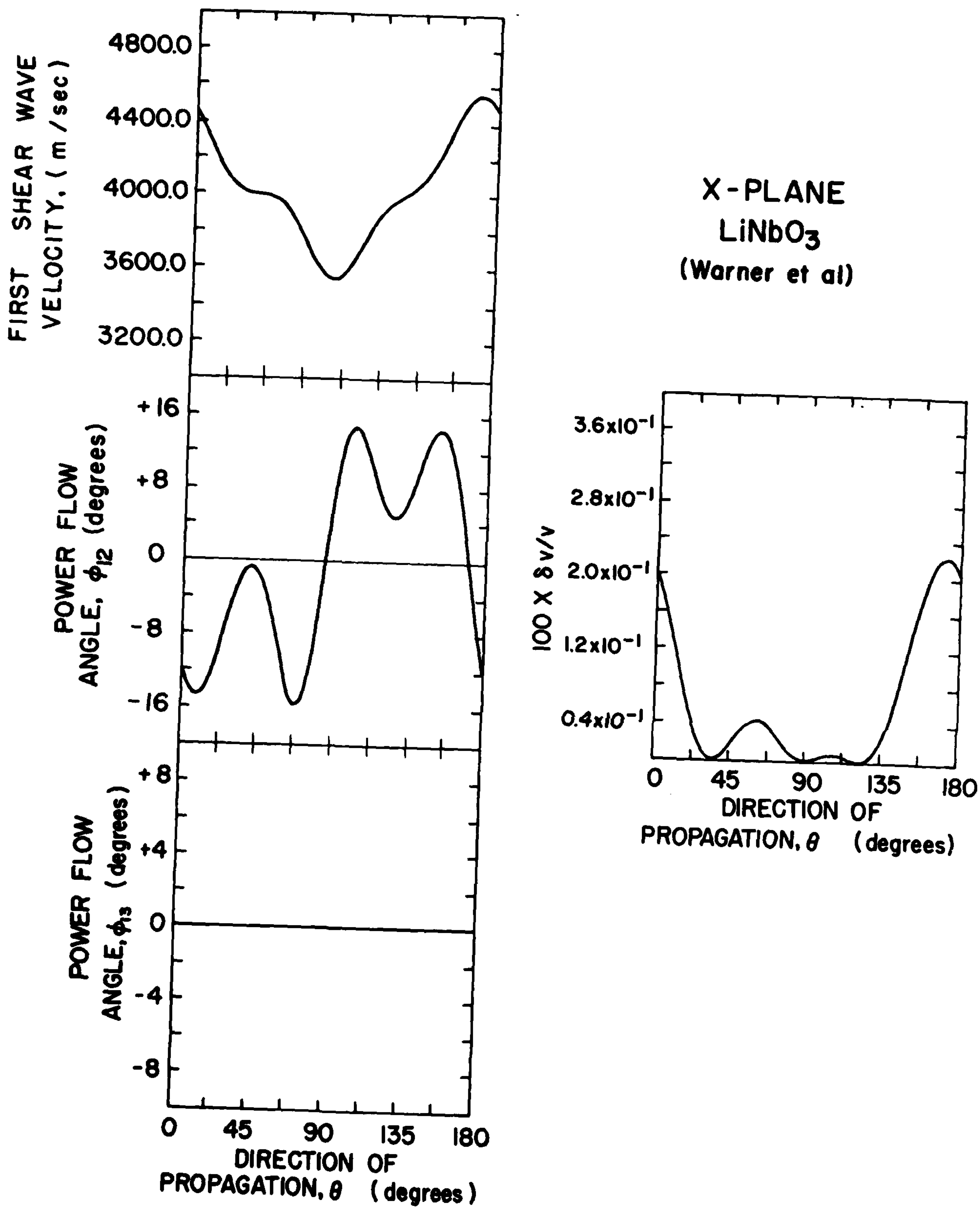
Z-PLANE
$LiNbO_3$
(Smith and Welsh)

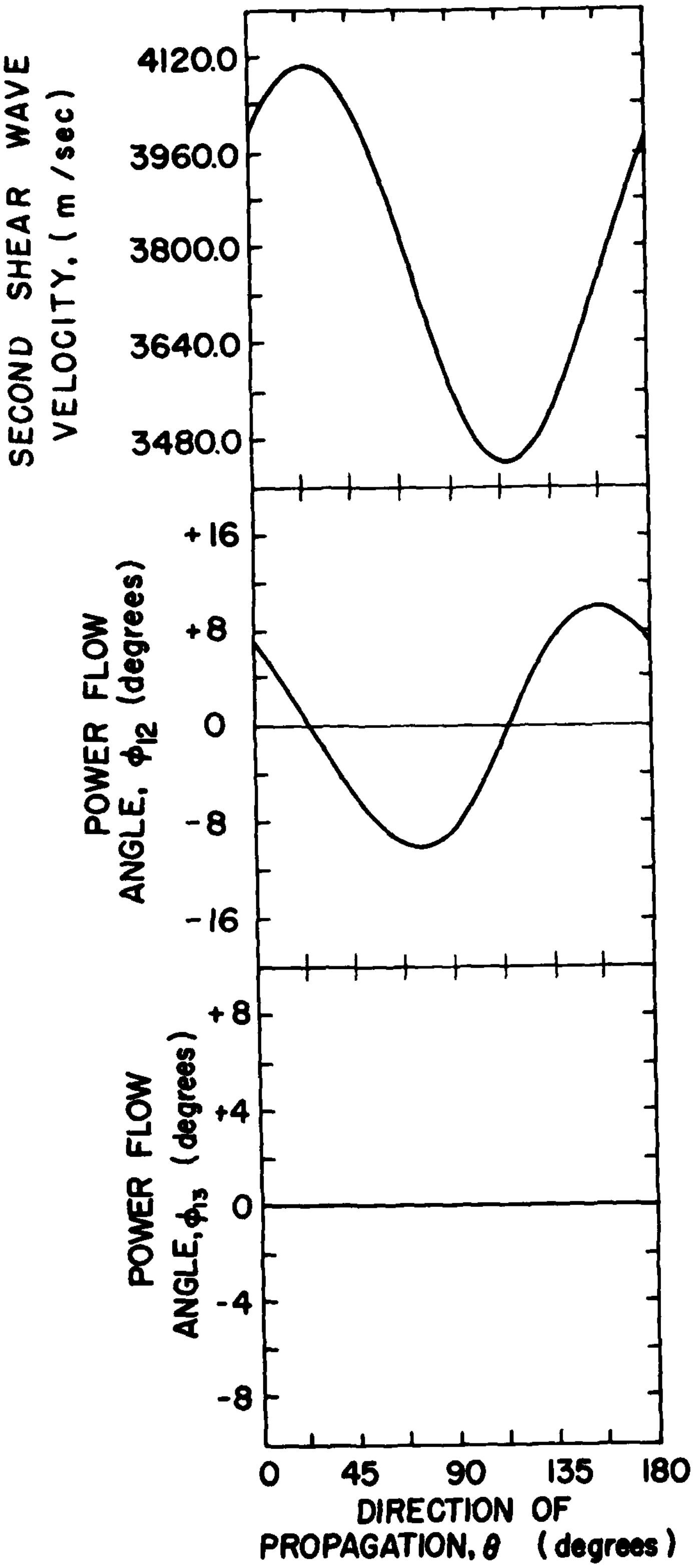




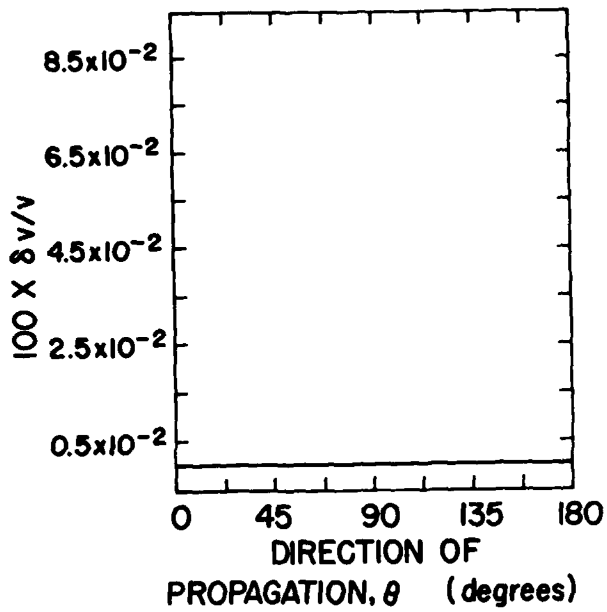


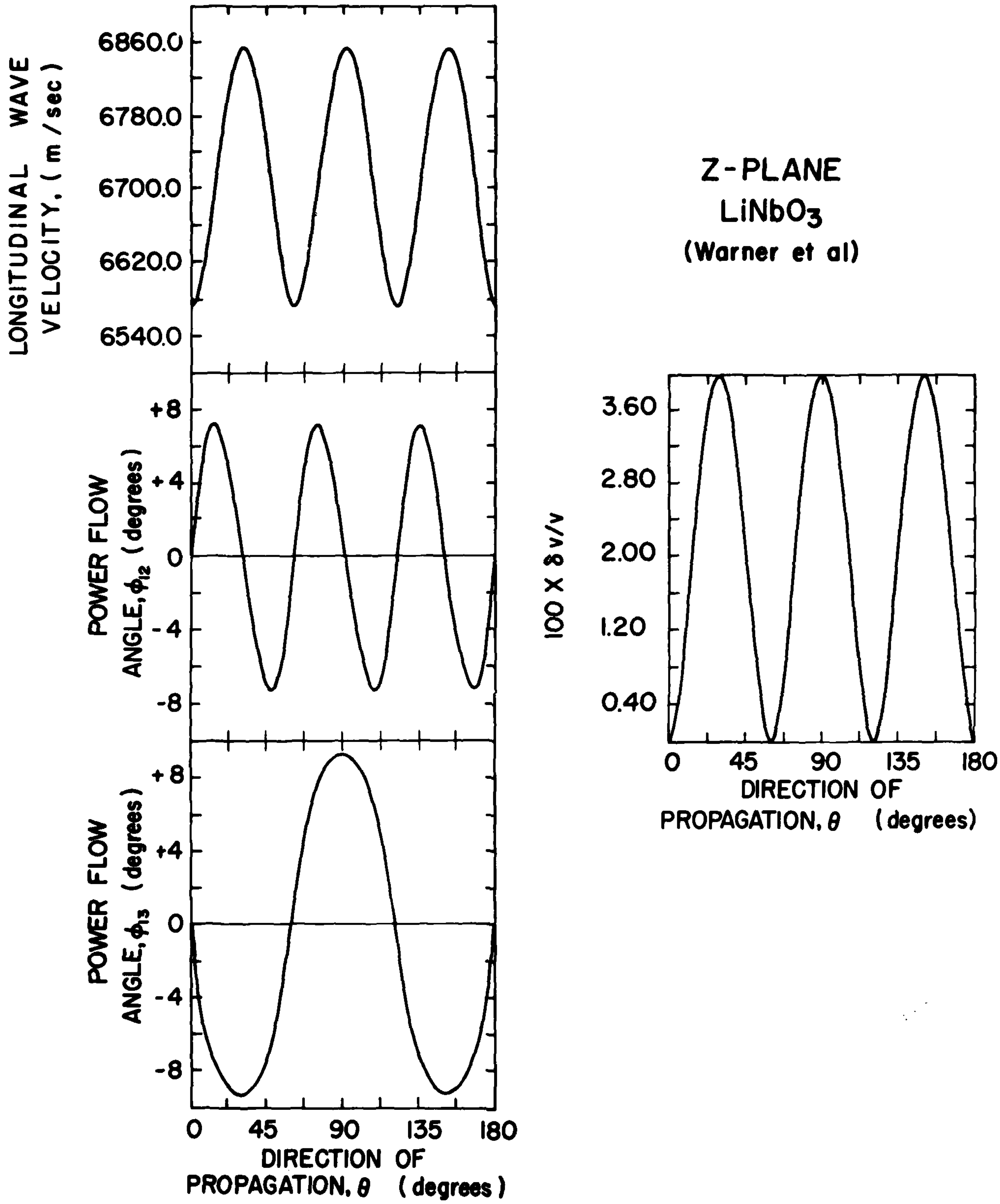
LONGITUDINAL WAVE VELOCITY, (m / sec)
7320.0
7160.0
7000.0
6840.0
6680.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
X-PLANE
$LiNbO_3$
(Warner et al)
$1.8x10^{+1}$
$1.4x10^{+1}$
$1.0x10^{+1}$
$0.6x10^{+1}$
$0.2x10^{+1}$
100 X $\delta v/v$
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

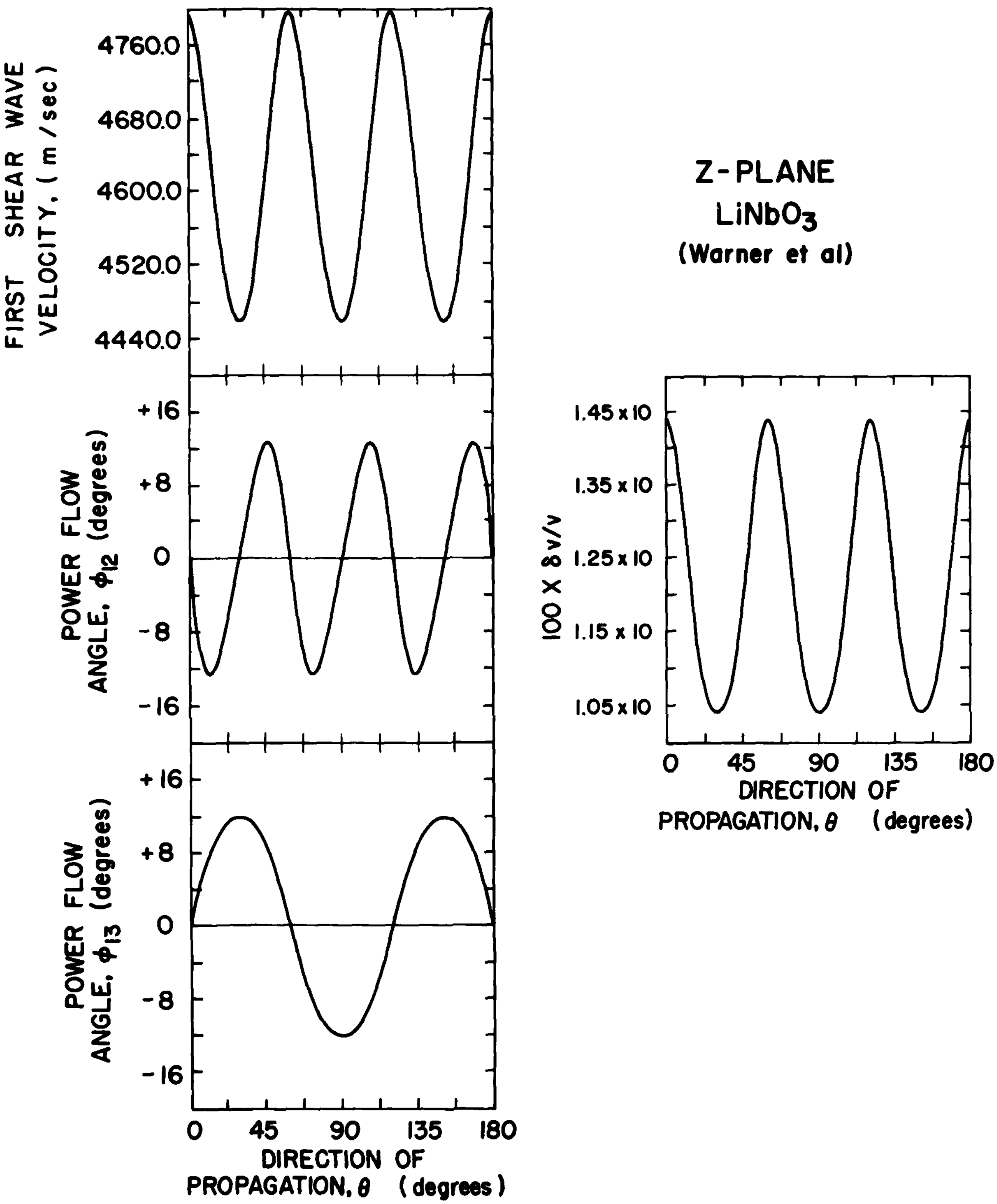

X-PLANE
$LiNbO_3$
(Warner et al)
FIRST SHEAR WAVE VELOCITY, (m/sec)
4800.0
4400.0
4000.0
3600.0
3200.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
3.6×10^{-1}
2.8×10^{-1}
2.0×10^{-1}
1.2×10^{-1}
0.4×10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

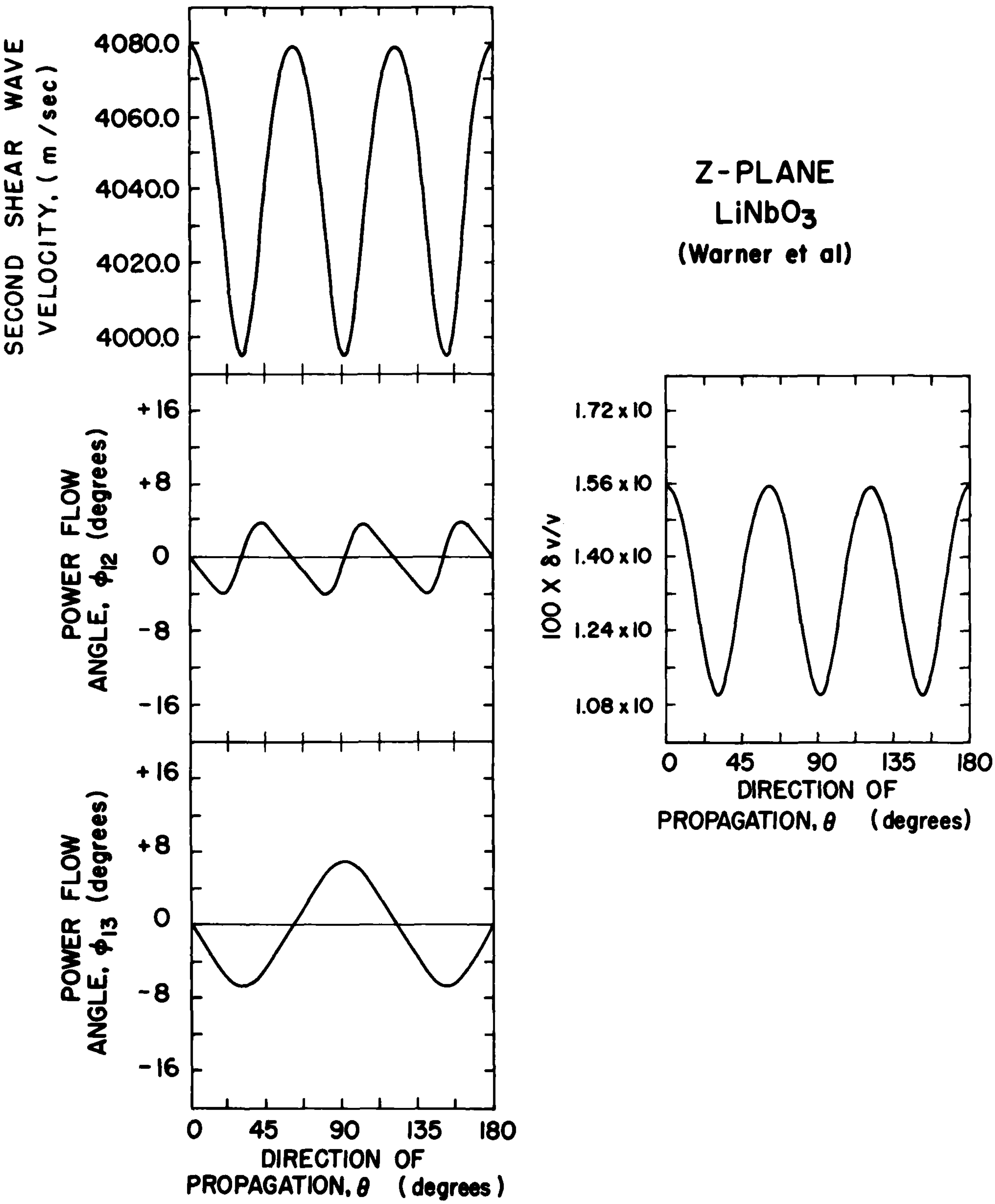


X-PLANE
$LiNbO_3$
(Warner et al)

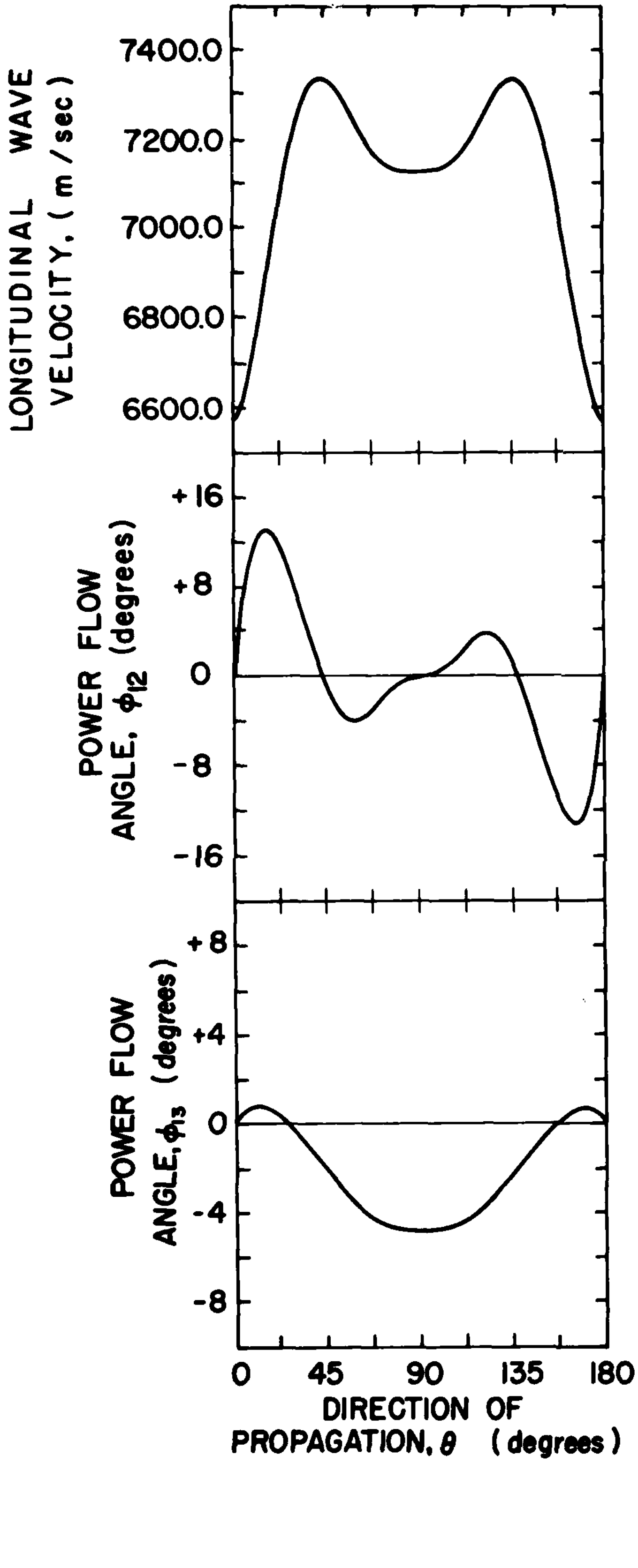


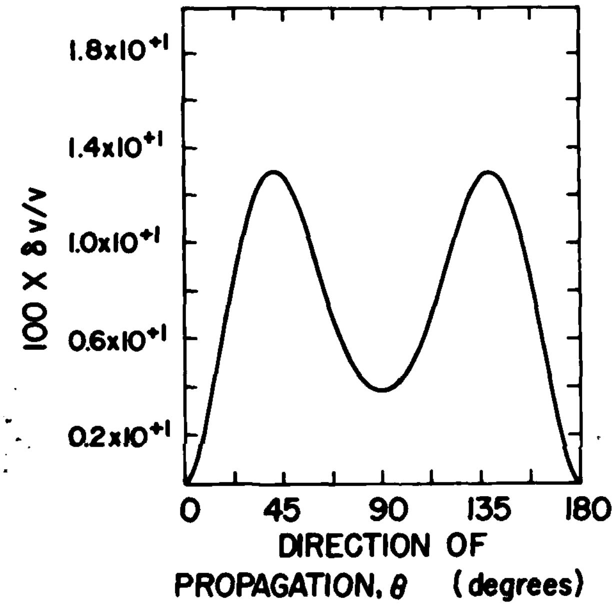

Z-PLANE
$LiNbO_3$
(Warner et al)
LONGITUDINAL WAVE VELOCITY, (m/sec)
6860.0
6780.0
6700.0
6620.0
6540.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
3.60
2.80
2.00
1.20
0.40
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

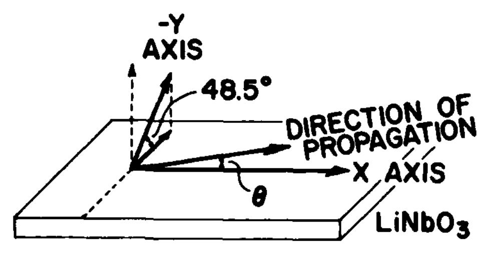

FIRST SHEAR WAVE VELOCITY, (m /sec)
4760.0
4680.0
4600.0
4520.0
4440.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
$LiNbO_3$
(Warner et al)
1.45 x 10
1.35 x 10
1.25 x 10
1.15 x 10
1.05 x 10
100 X $\delta v/v$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

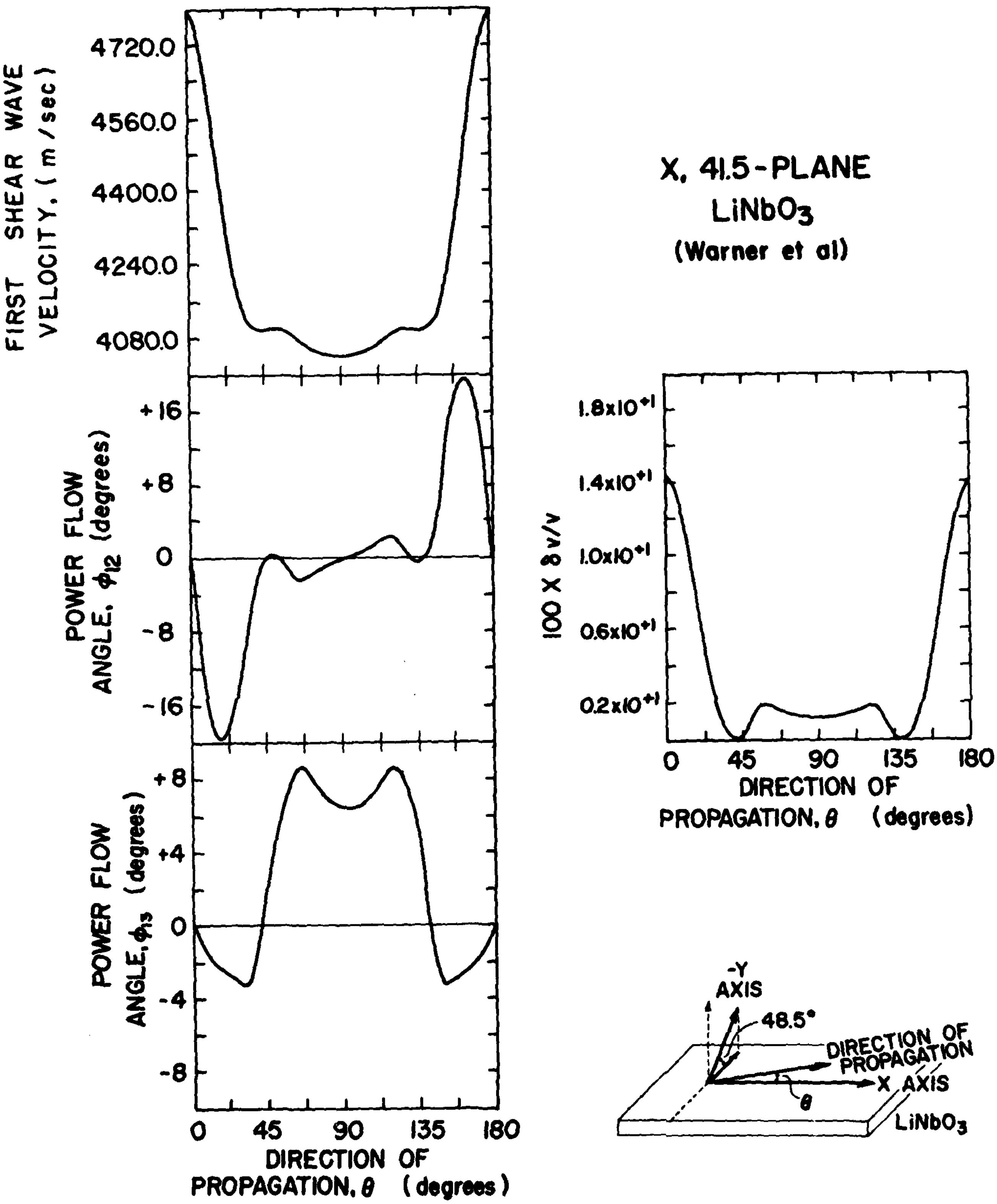

SECOND SHEAR WAVE VELOCITY, (m /sec)
4080.0
4060.0
4040.0
4020.0
4000.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
$LiNbO_3$
(Warner et al)
100 X $\delta v/v$
1.72 x 10
1.56 x 10
1.40 x 10
1.24 x 10
1.08 x 10
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

X, 41.5-PLANE
$LiNbO_3$
(Warner et al)

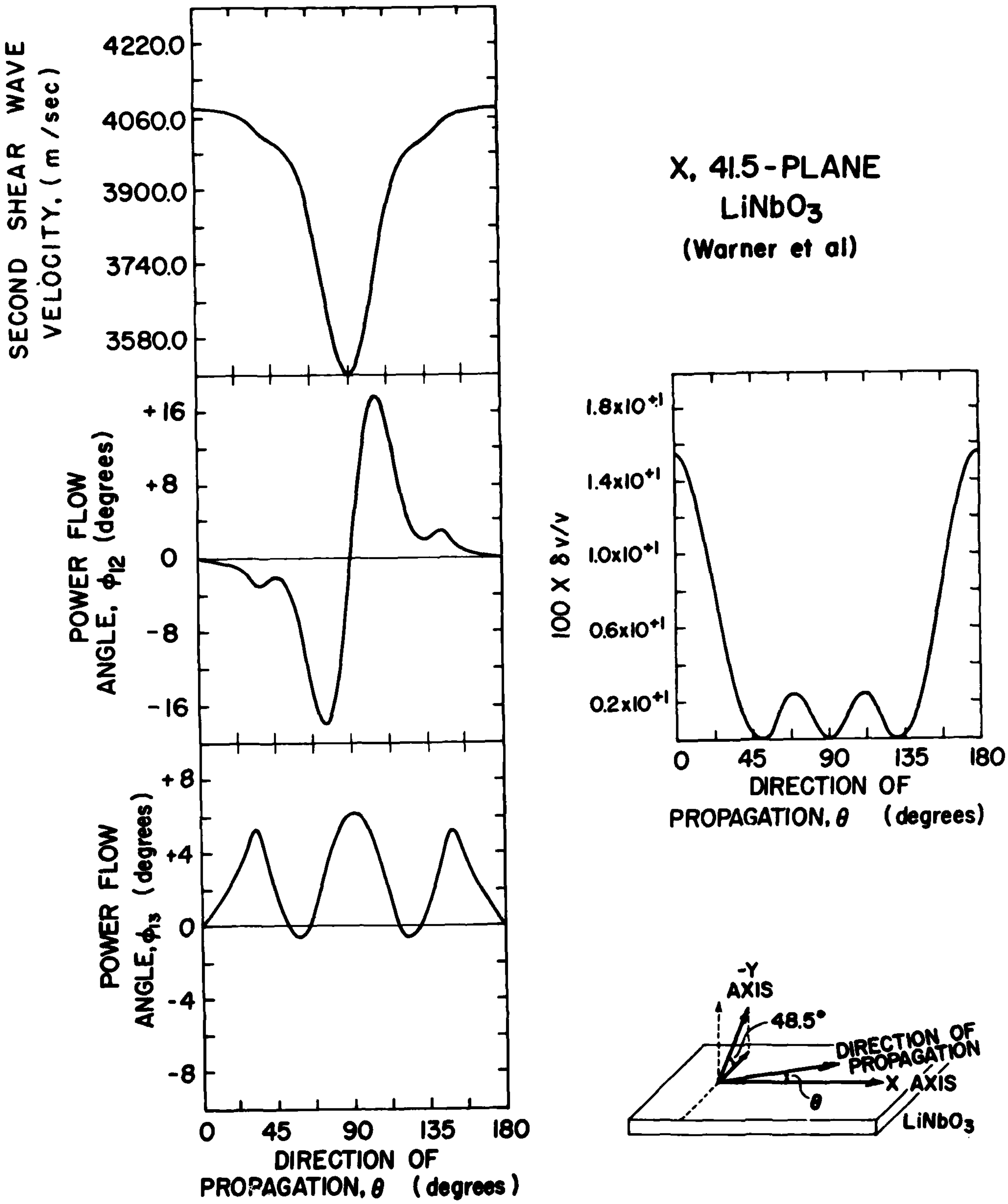


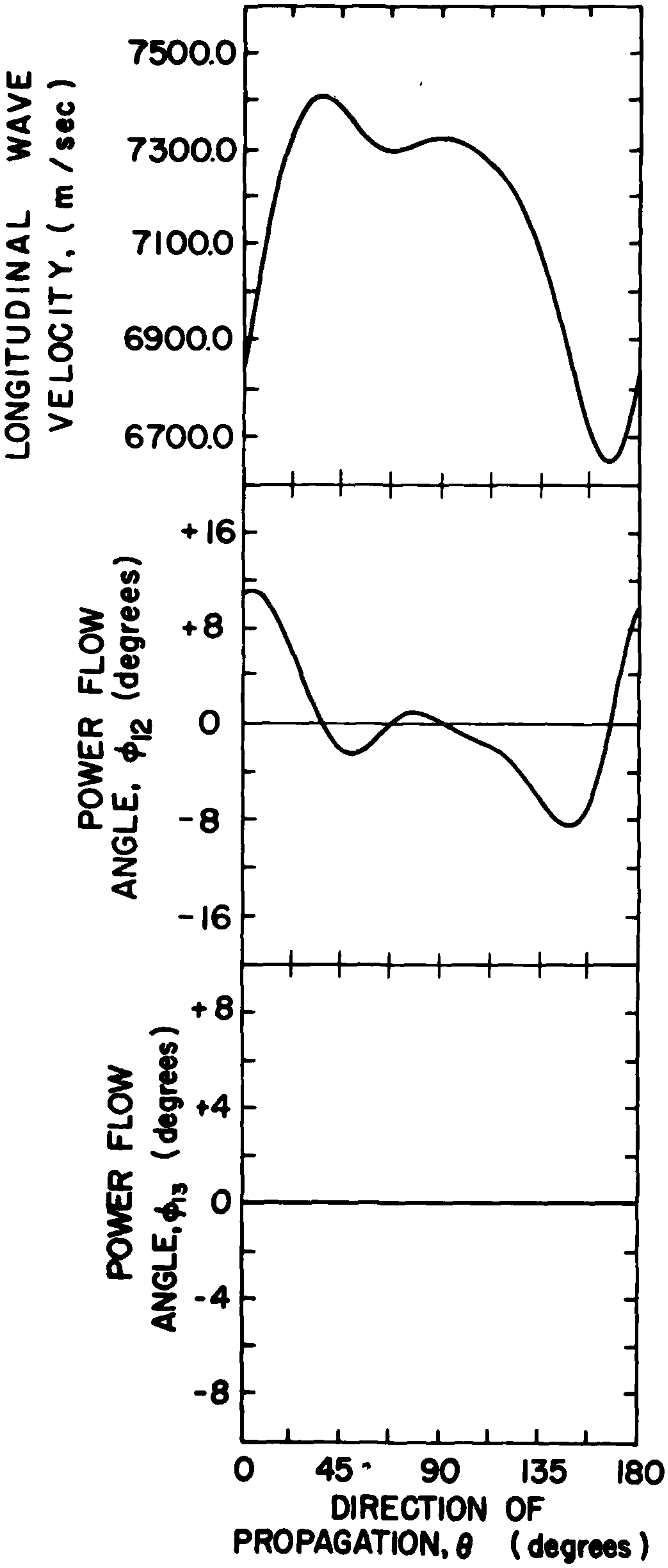




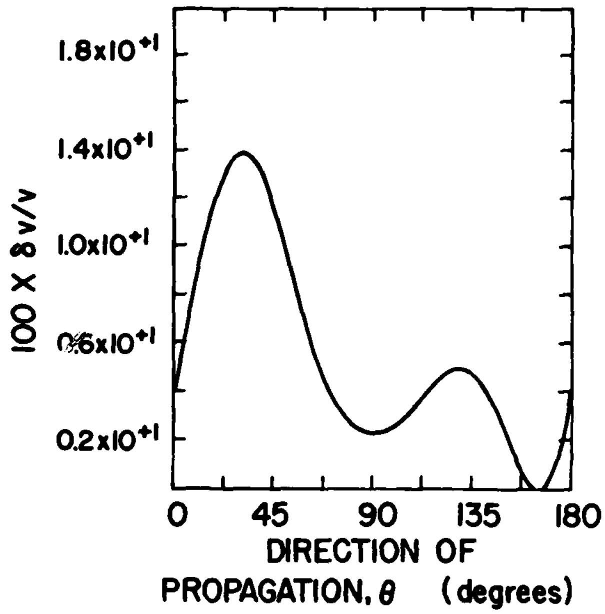


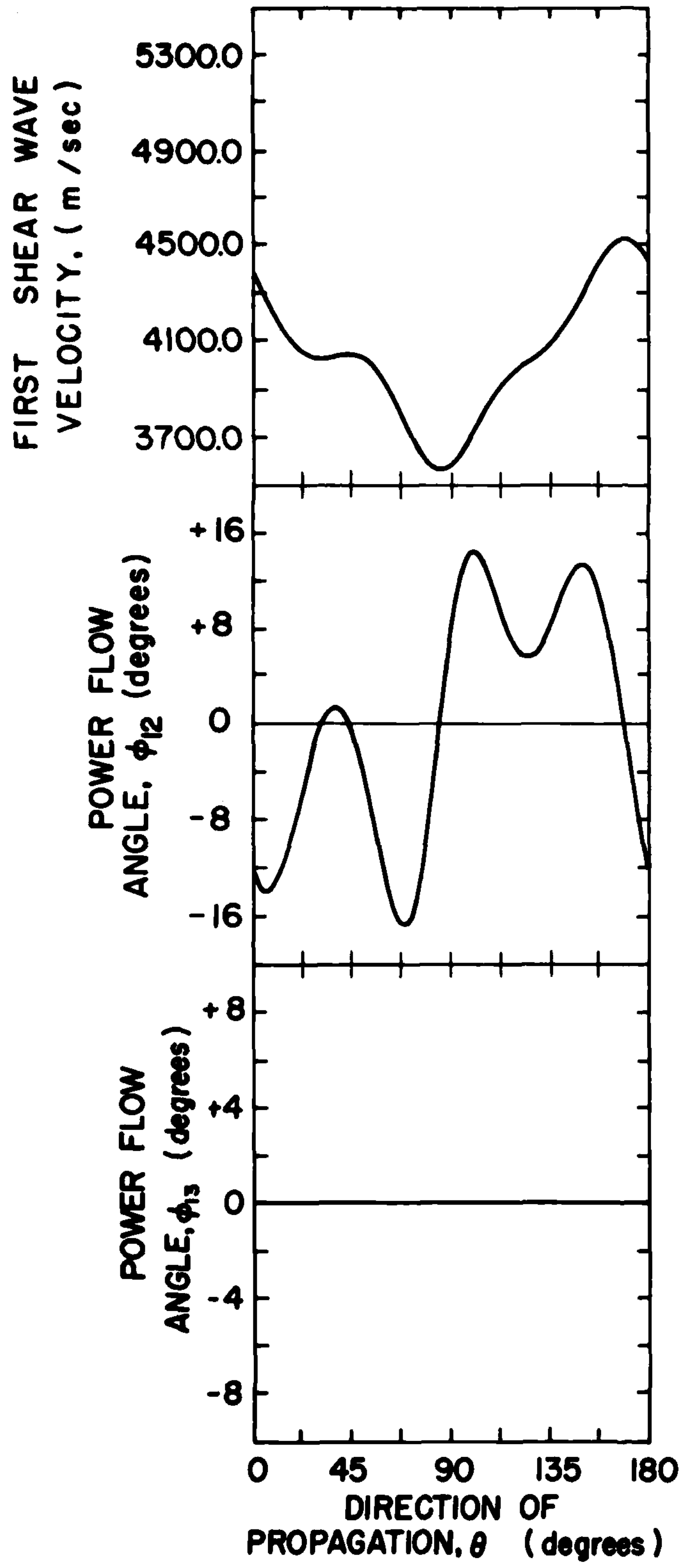
X, 41.5-PLANE
LiNbO3
(Warner et al)
FIRST SHEAR WAVE VELOCITY, (m / sec)
4720.0
4560.0
4400.0
4240.0
4080.0
POWER FLOW ANGLE, φ12 (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, φ13 (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X δv/v
1.8x10+1
1.4x10+1
1.0x10+1
0.6x10+1
0.2x10+1
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
-Y AXIS
48.5°
DIRECTION OF PROPAGATION
X AXIS
θ
LiNbO3


X, 41.5-PLANE
$LiNbO_3$
(Warner et al)
SECOND SHEAR WAVE VELOCITY, (m/sec)
4220.0
4060.0
3900.0
3740.0
3580.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
$1.8 \times 10^{+1}$
$1.4 \times 10^{+1}$
$1.0 \times 10^{+1}$
$0.6 \times 10^{+1}$
$0.2 \times 10^{+1}$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
-Y AXIS
48.5°
DIRECTION OF PROPAGATION
X AXIS
θ
$LiNbO_3$

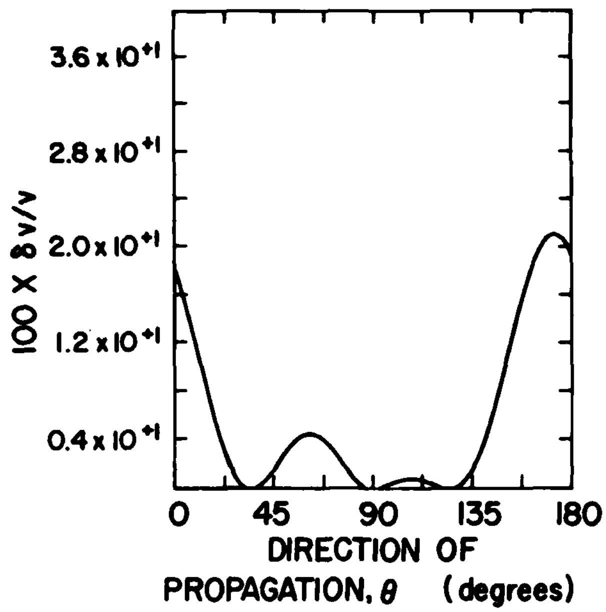


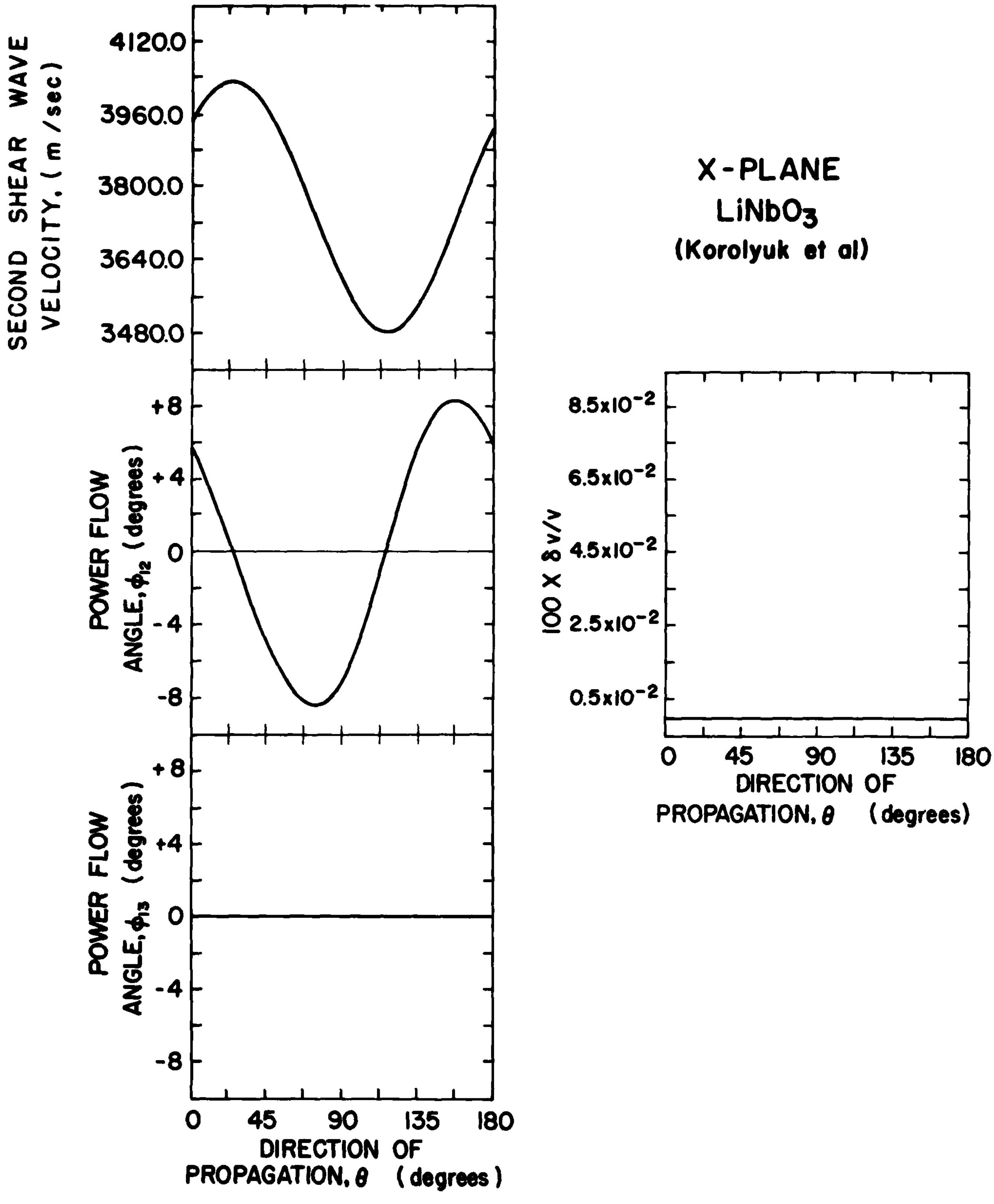
X-PLANE
$LiNbO_3$
(Korolyuk et al)

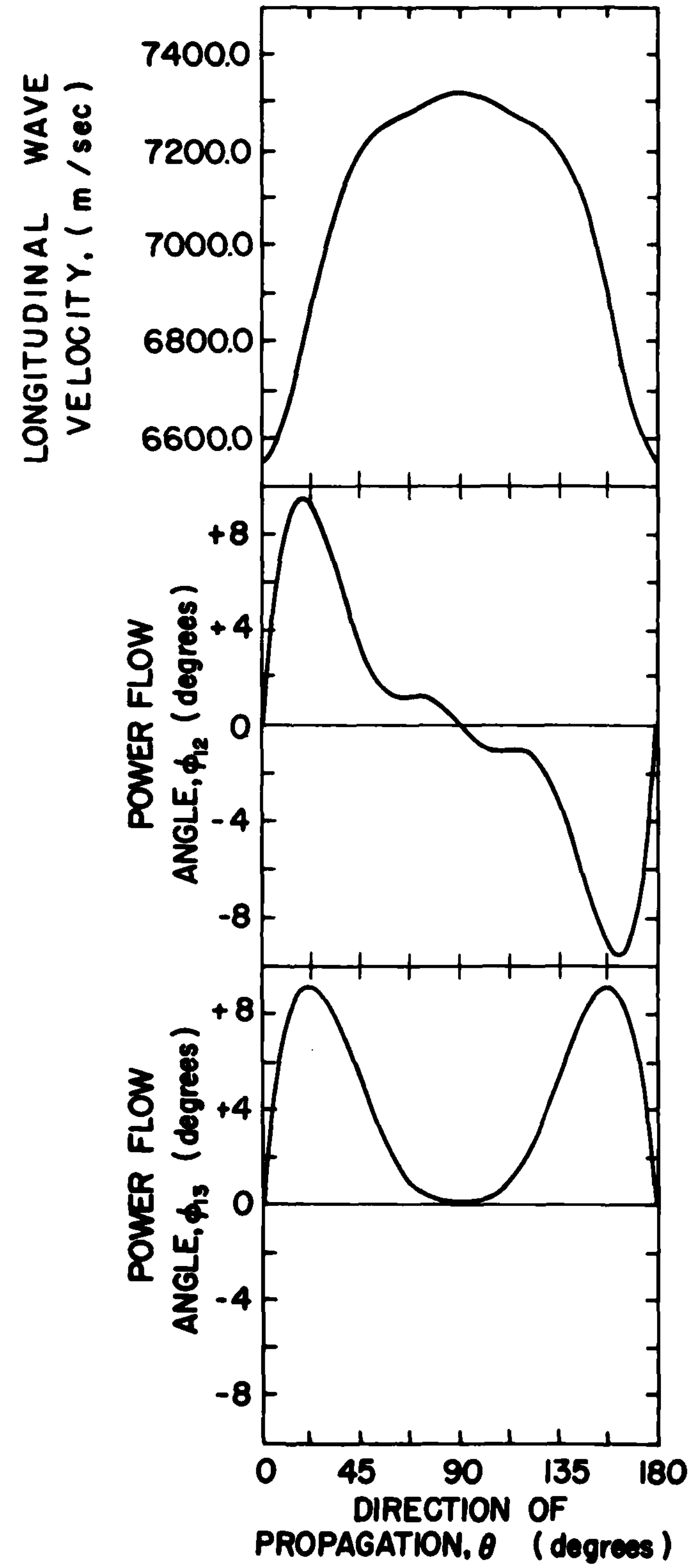




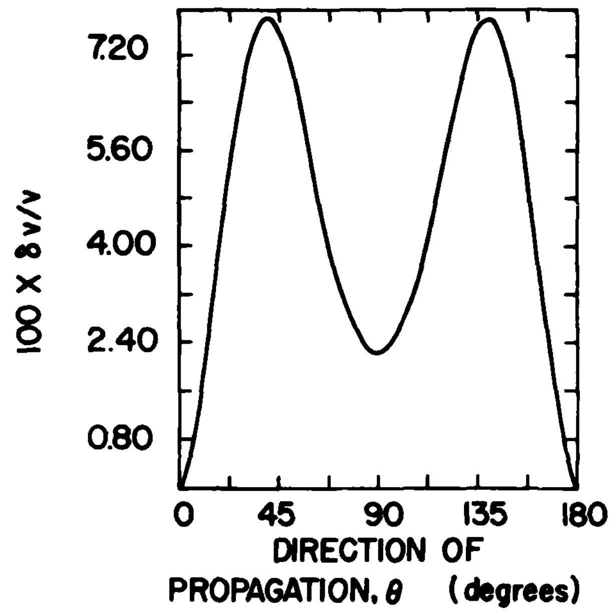
X-PLANE
$LiNbO_3$
(Korolyuk et al)

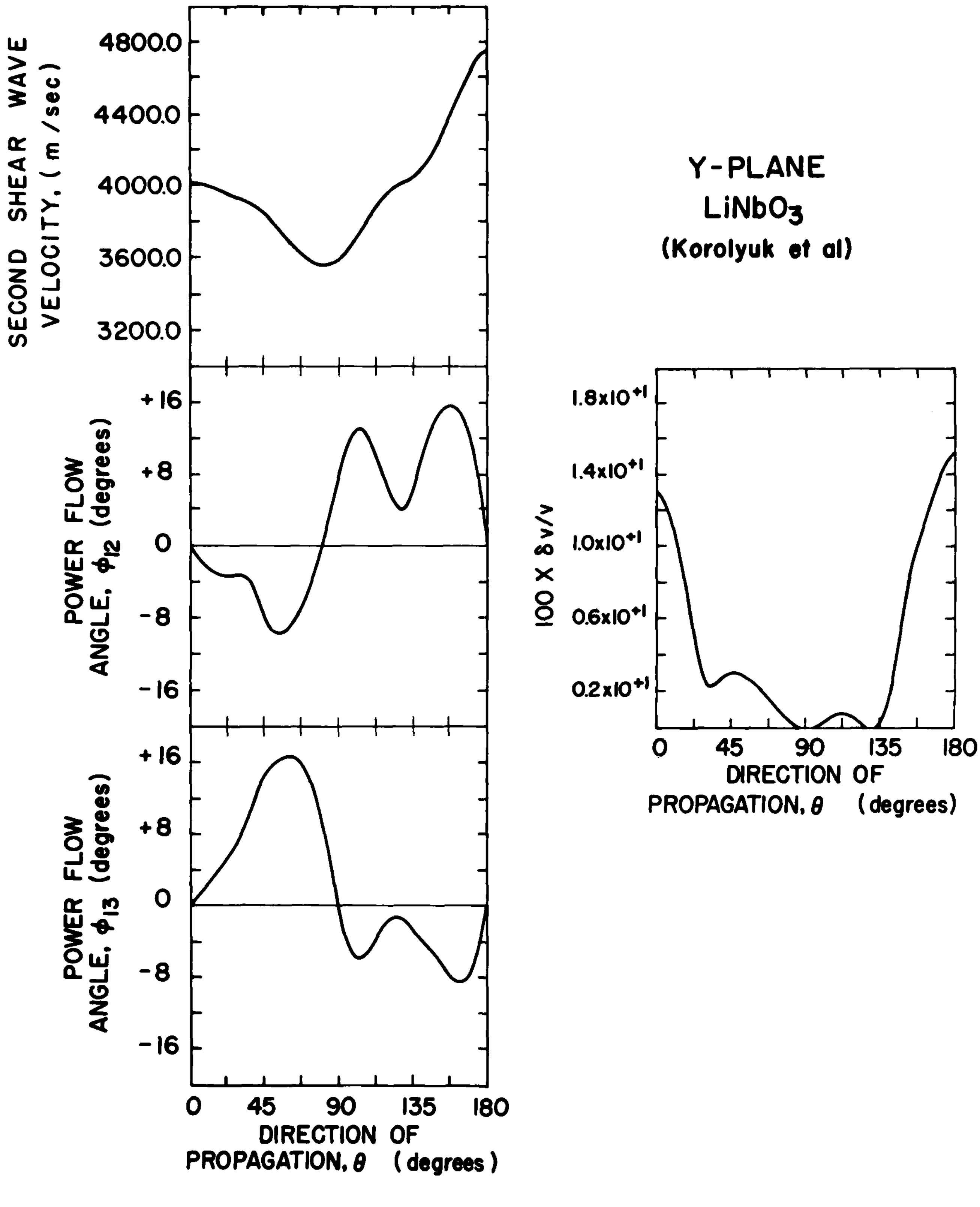



SECOND SHEAR WAVE VELOCITY, (m/sec)
4120.0
3960.0
3800.0
3640.0
3480.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
X-PLANE
$LiNbO_3$
(Korolyuk et al)
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
$100 \times \delta v/v$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

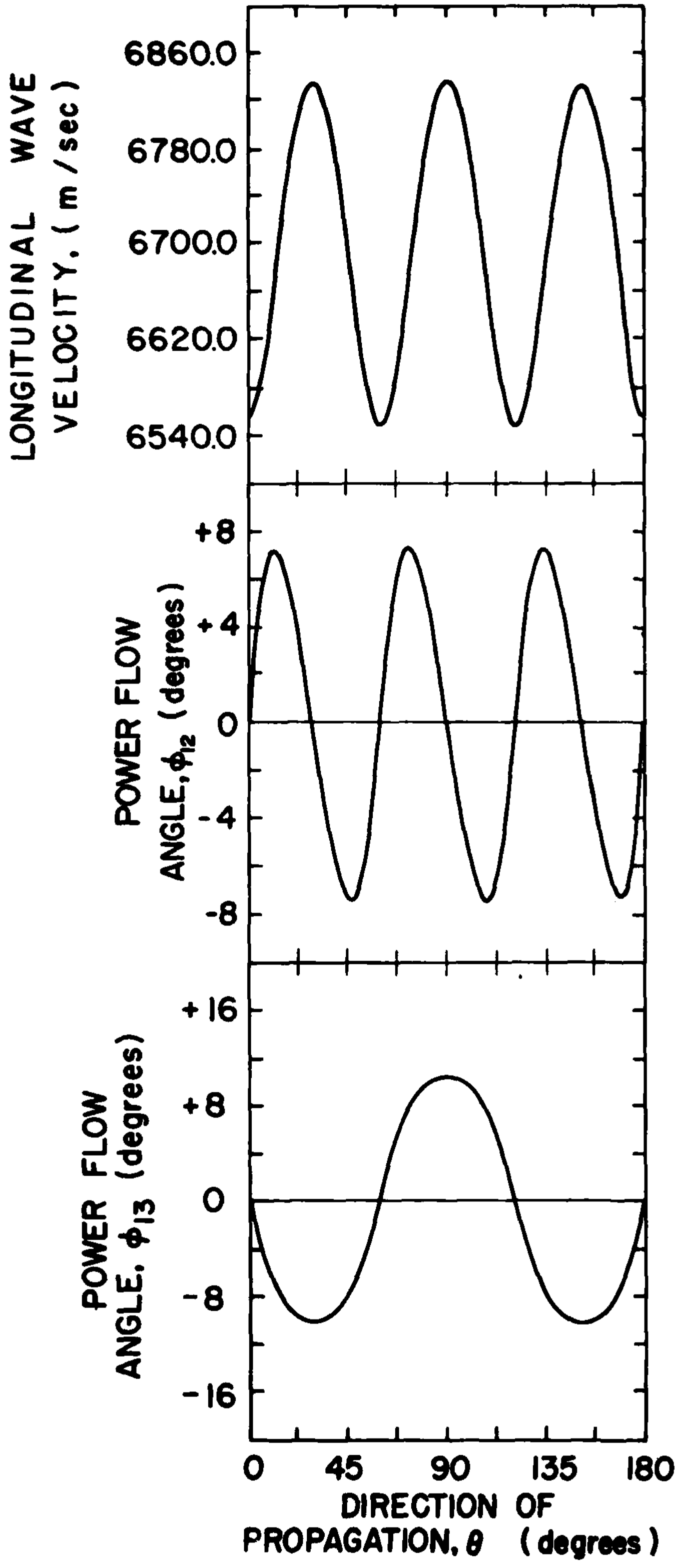


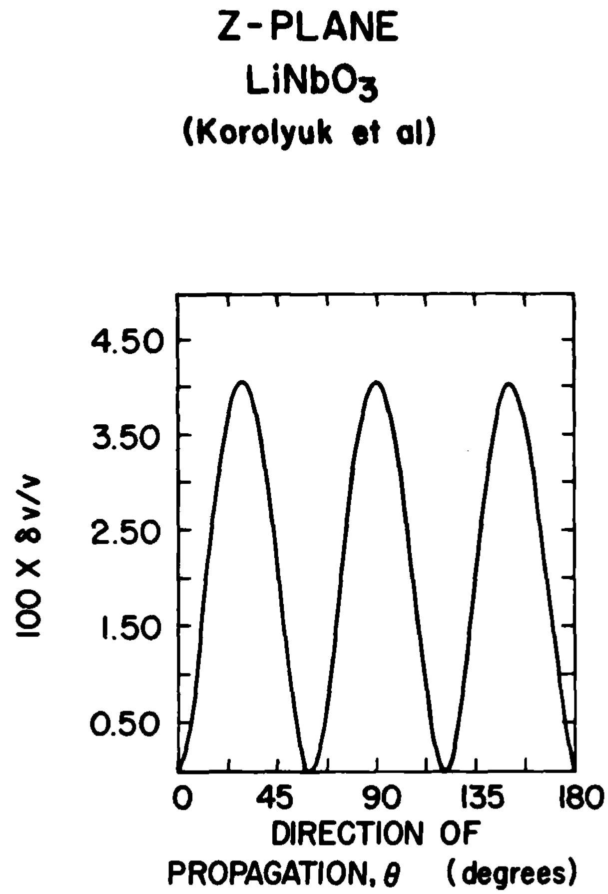
Y-PLANE
$LiNbO_3$
(Korolyuk et al)

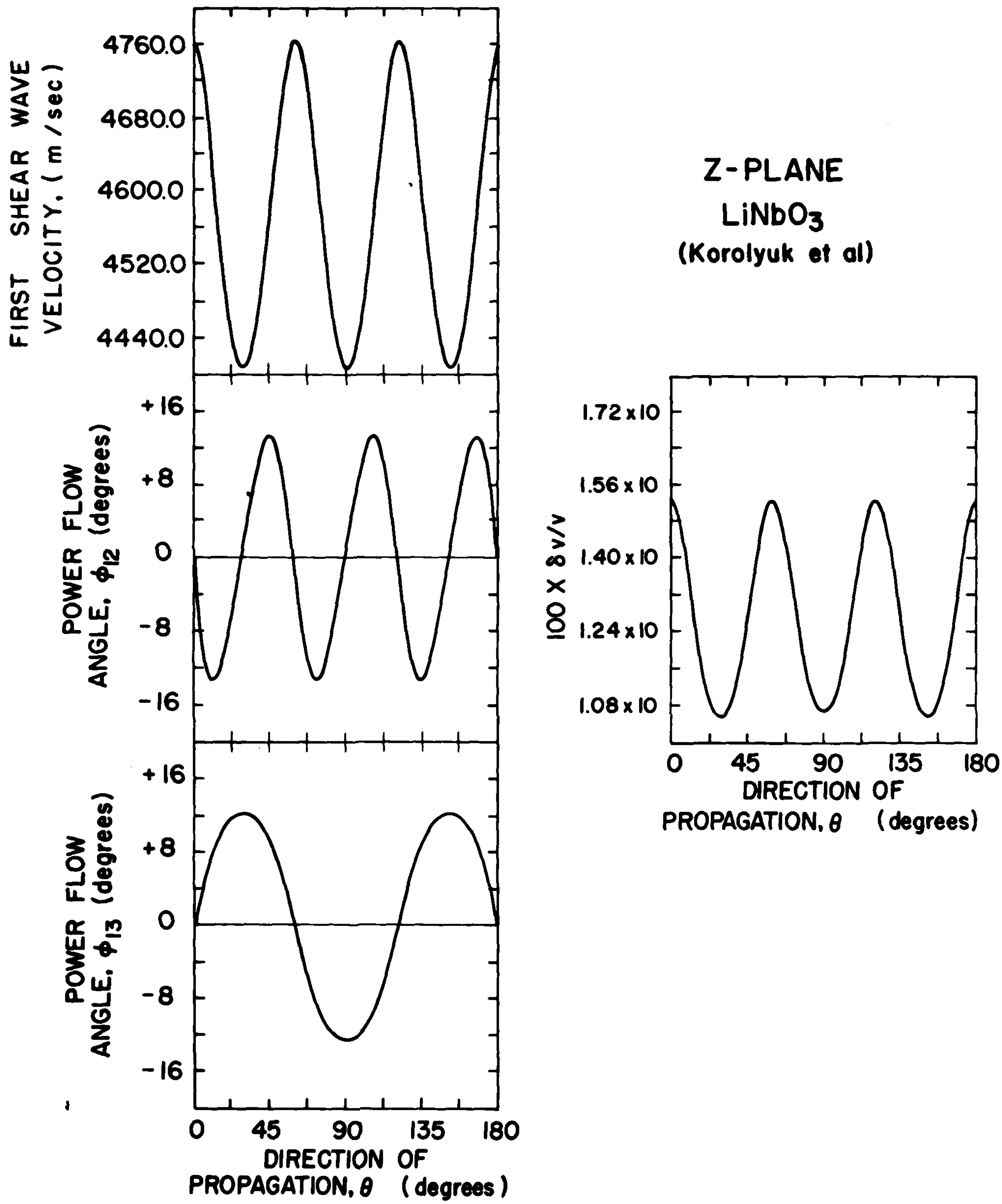


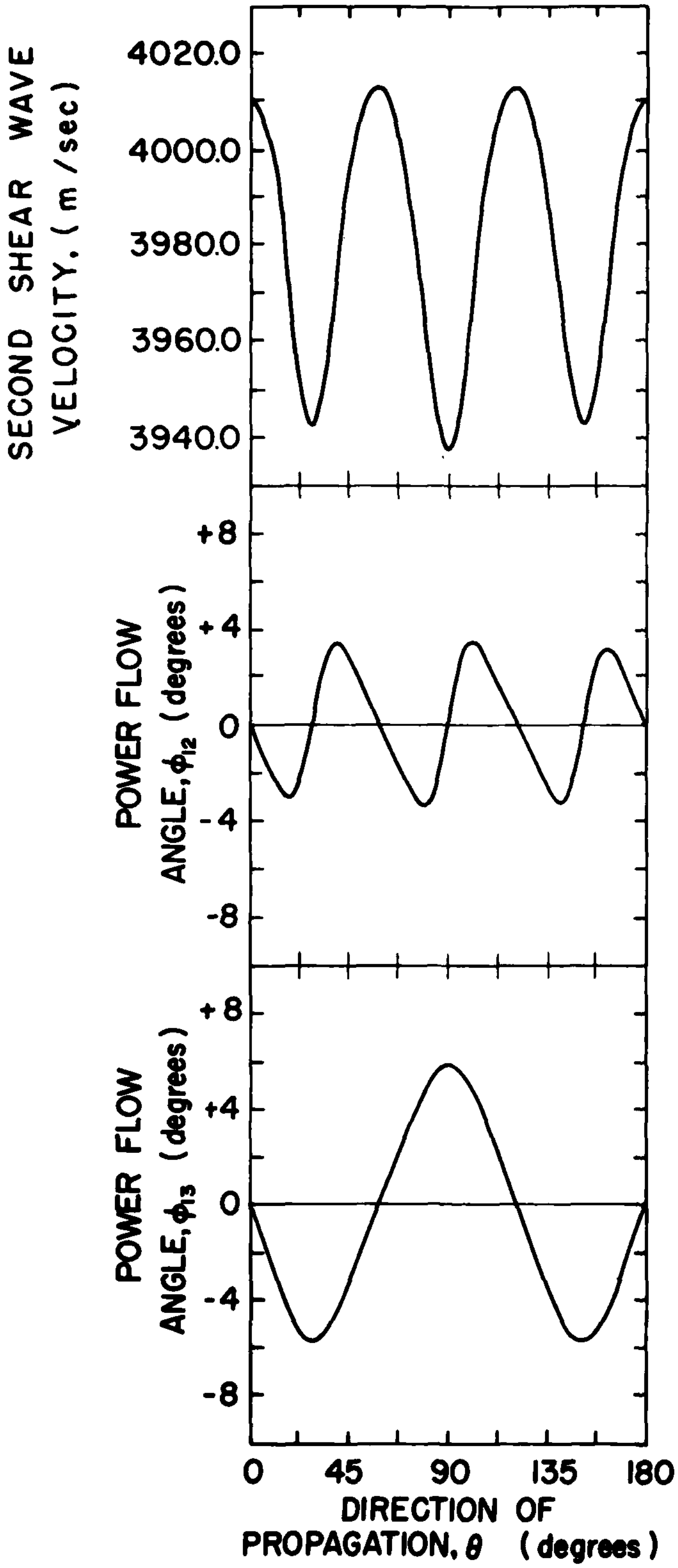


Y-PLANE
$LiNbO_3$
(Korolyuk et al)

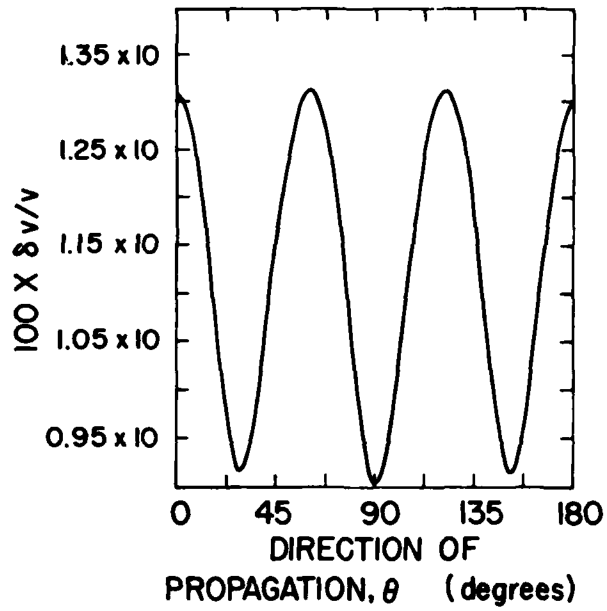

6860.0
6780.0
6700.0
6620.0
6540.0
LONGITUDINAL WAVE VELOCITY, (m / sec)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

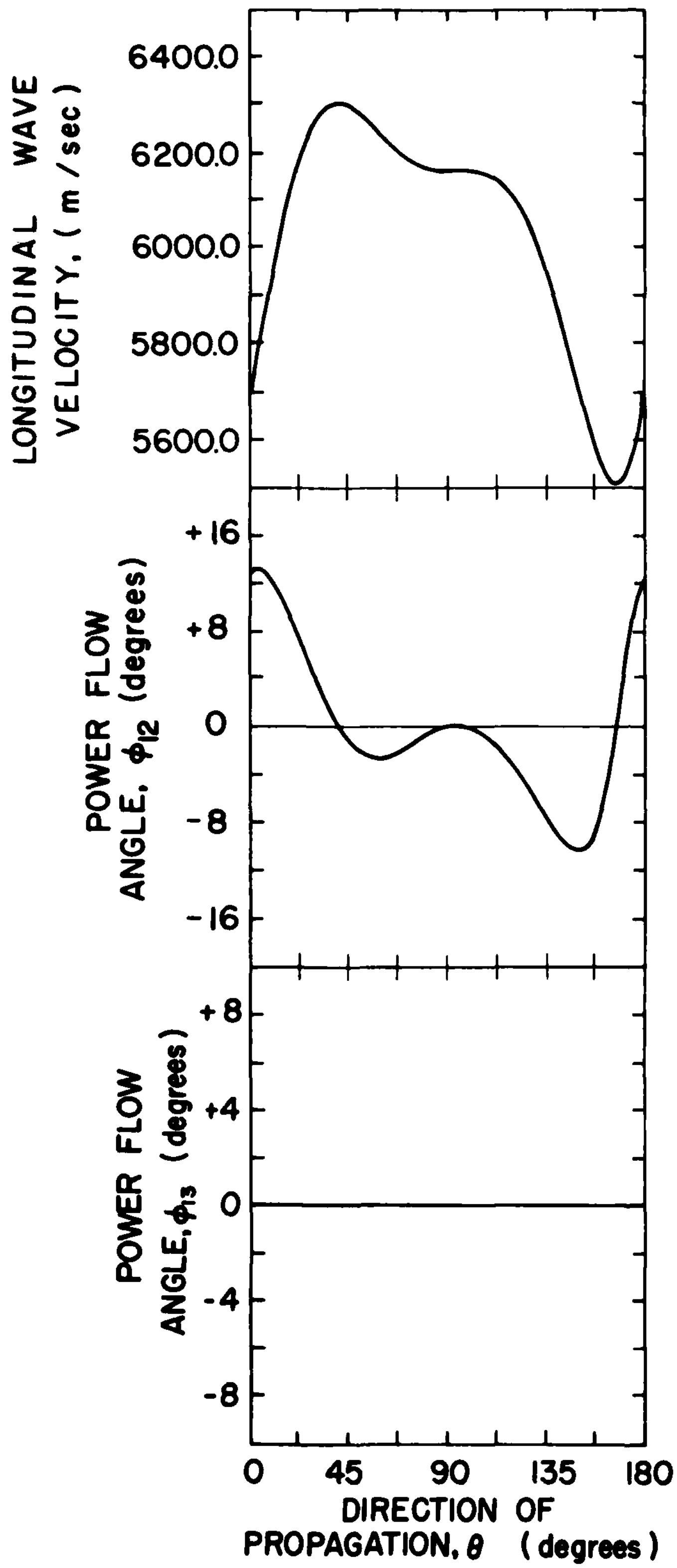

Z-PLANE
$LiNbO_3$
(Korolyuk et al)
4.50
3.50
2.50
1.50
0.50
100 X $\delta v/v$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


FIRST SHEAR WAVE VELOCITY, (m /sec)
4760.0
4680.0
4600.0
4520.0
4440.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
$LiNbO_3$
(Korolyuk et al)
100 X $\delta v/v$
1.72 x 10
1.56 x 10
1.40 x 10
1.24 x 10
1.08 x 10
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

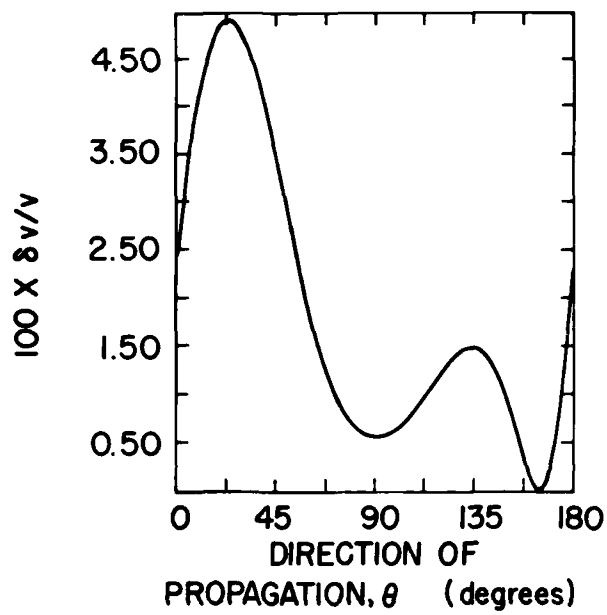


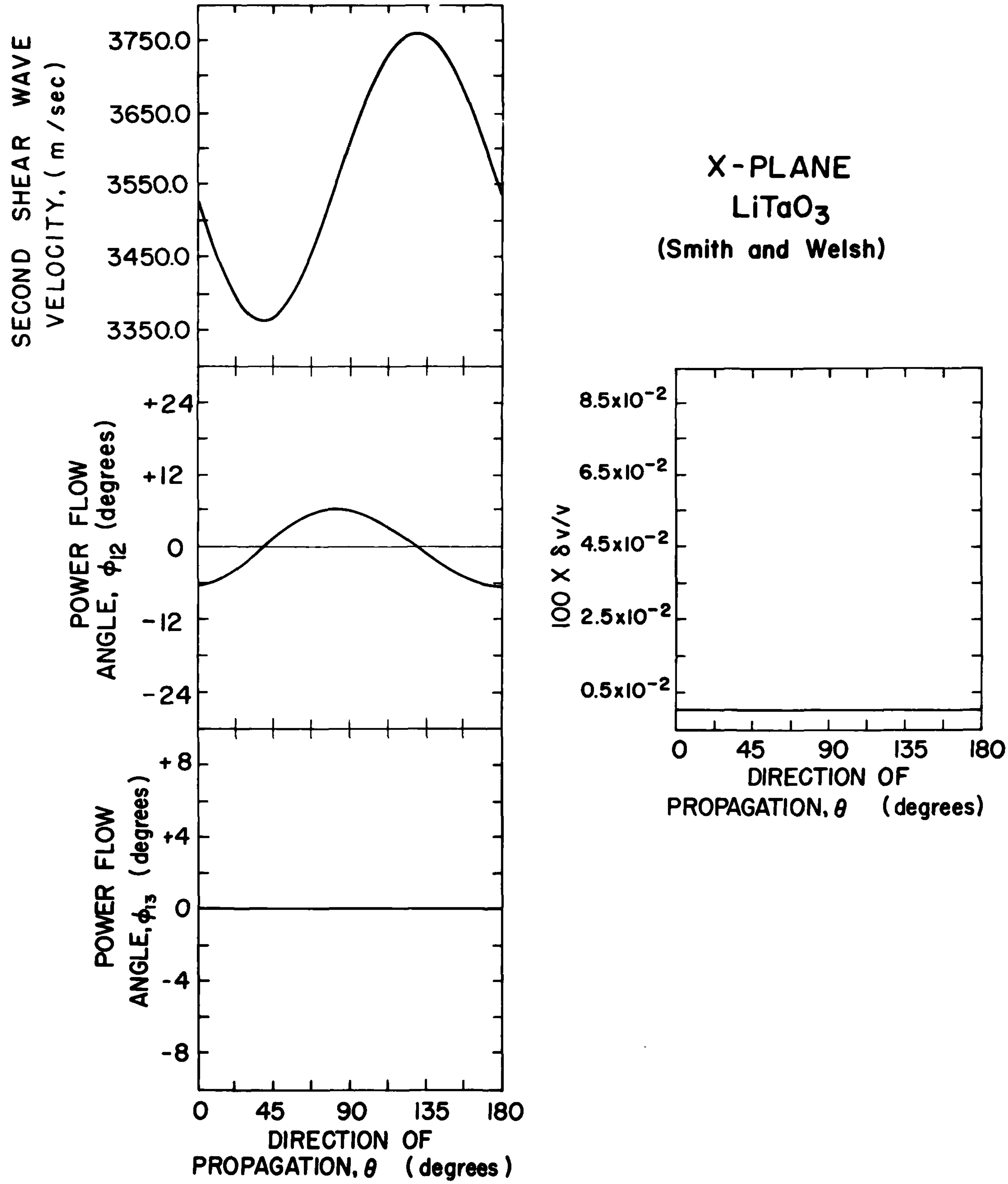
Z-PLANE
$LiNbO_3$
(Korolyuk et al)

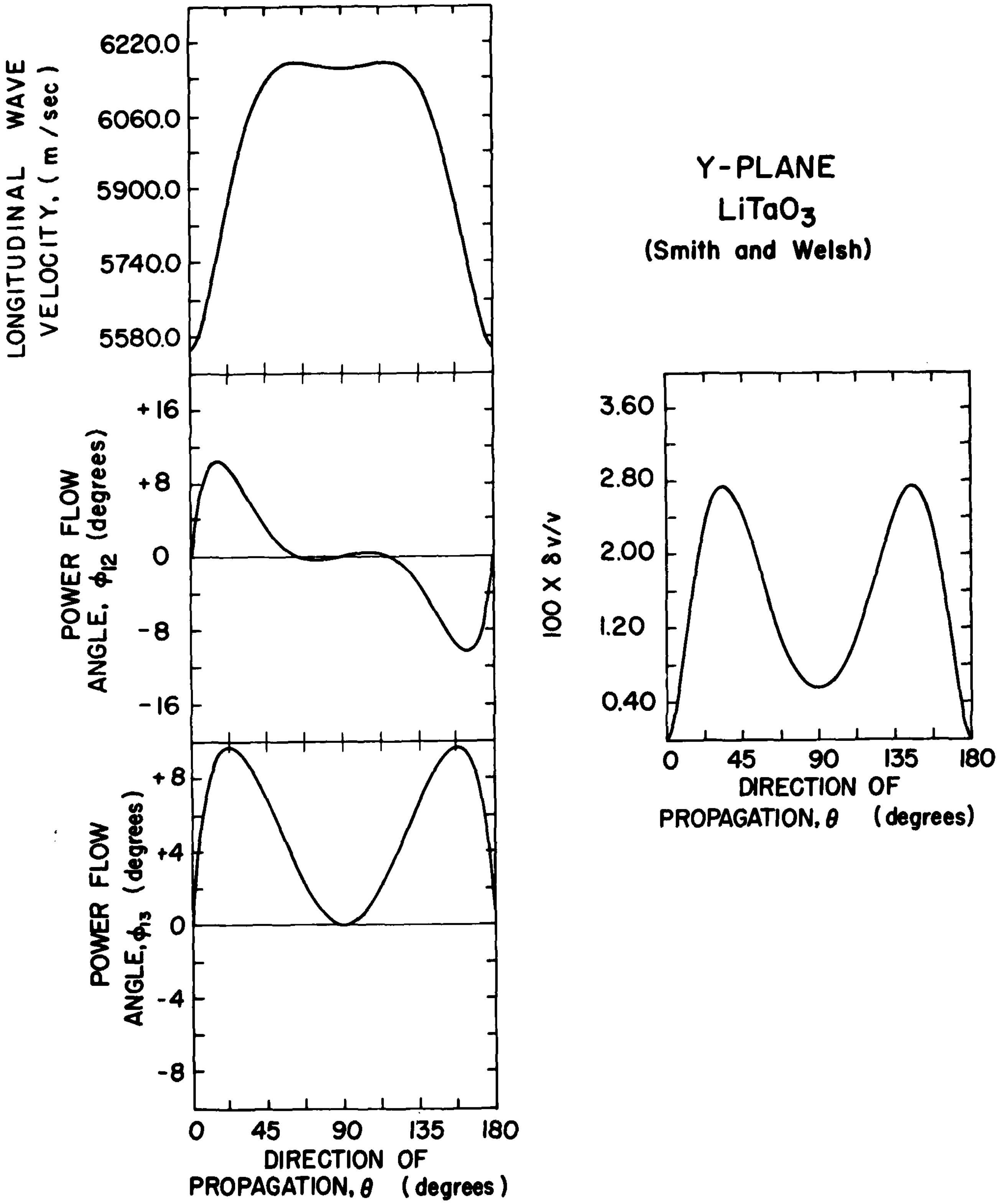


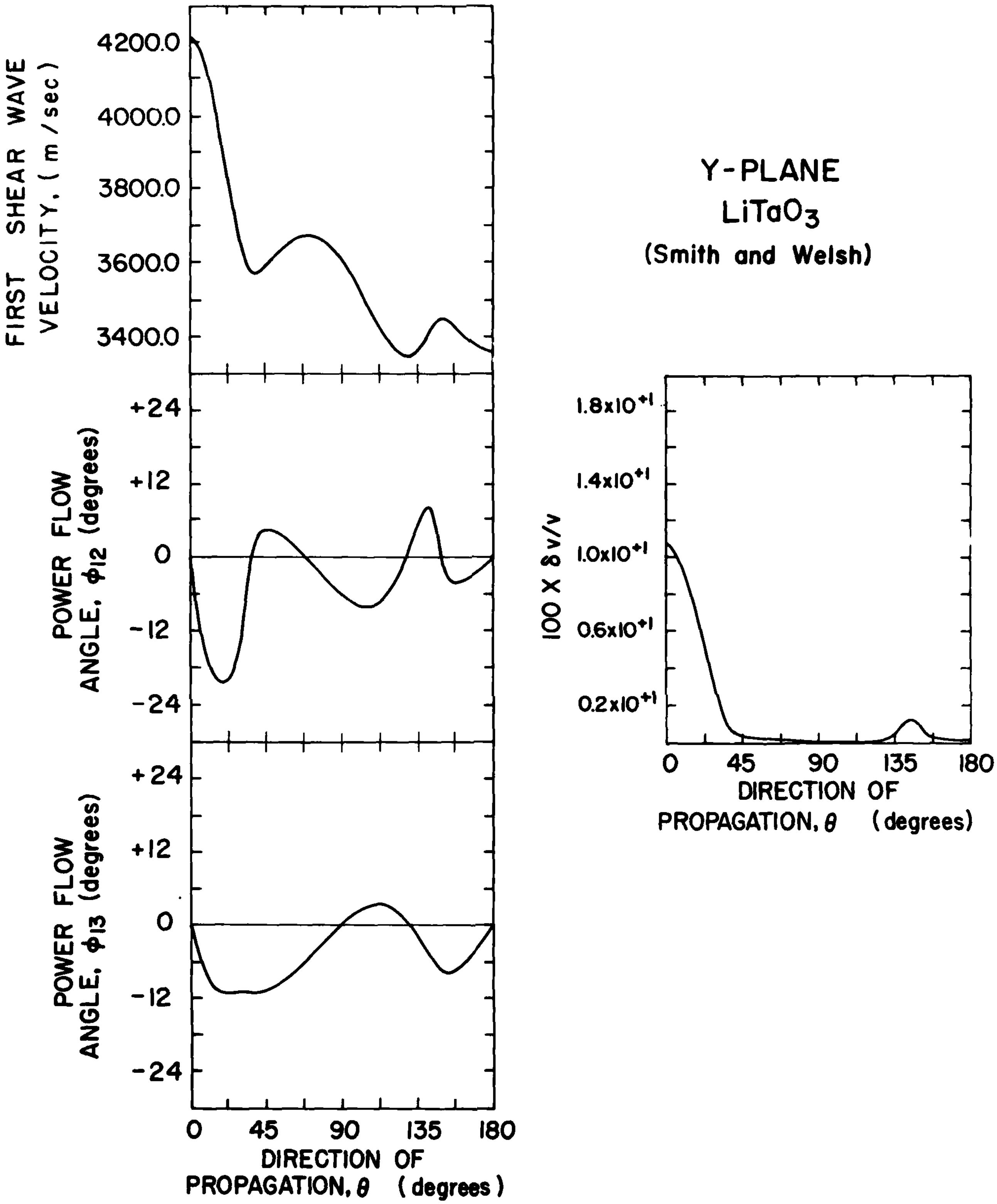


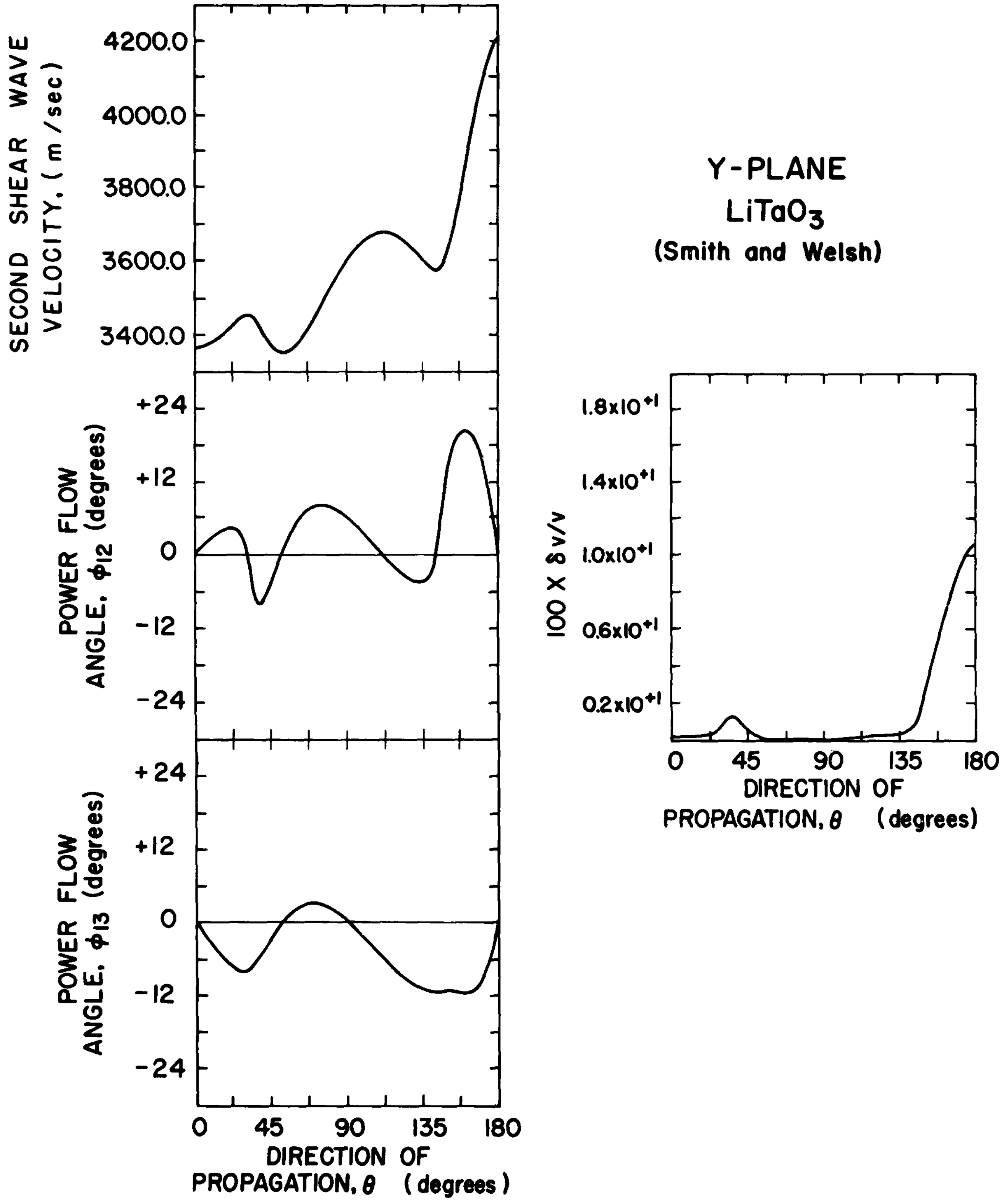
X-PLANE
$LiTaO_3$
(Smith and Welsh)



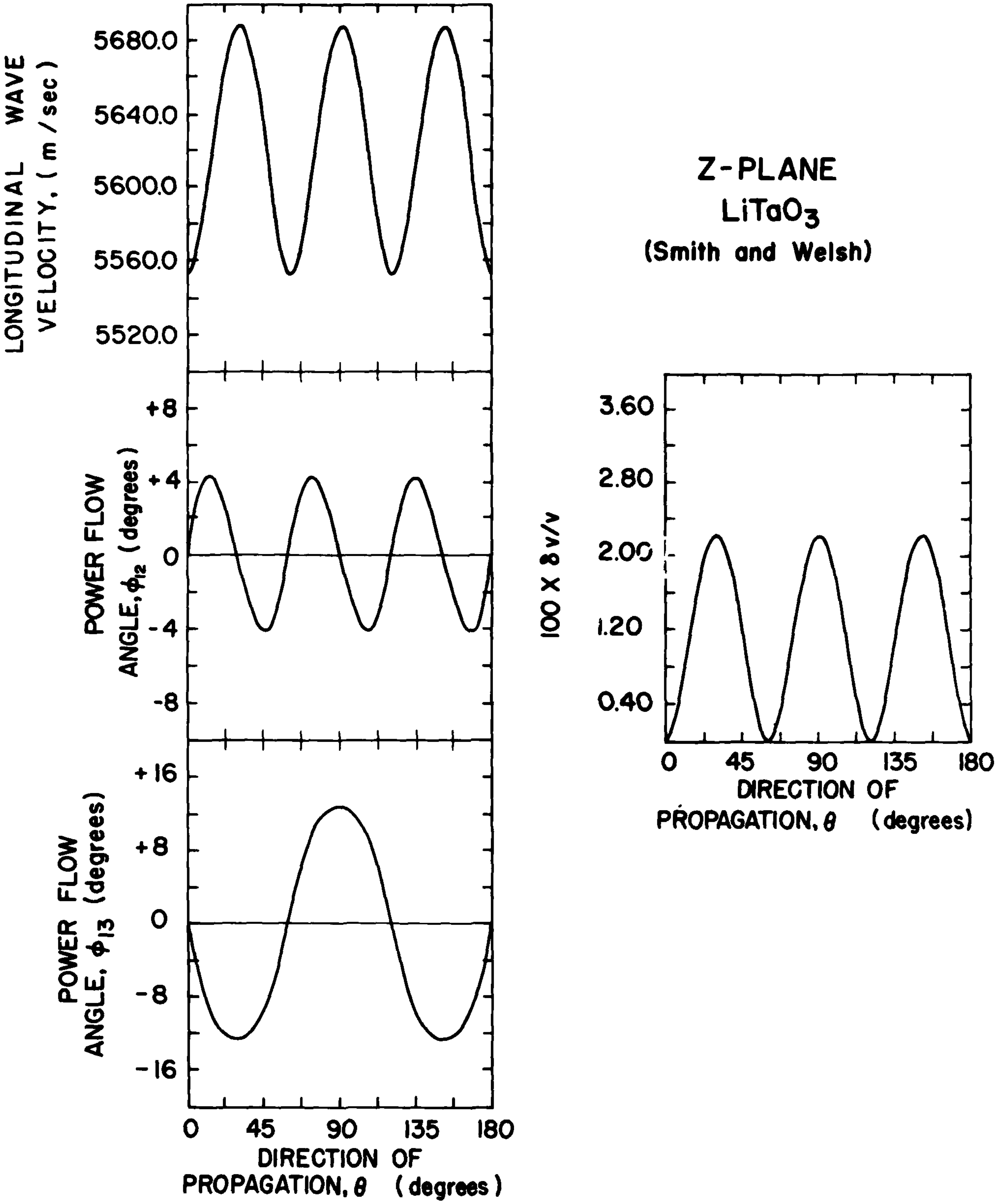

SECOND SHEAR WAVE VELOCITY, (m/sec)
3750.0
3650.0
3550.0
3450.0
3350.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
X-PLANE
$LiTaO_3$
(Smith and Welsh)
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


LONGITUDINAL WAVE VELOCITY, (m / sec)
6220.0
6060.0
5900.0
5740.0
5580.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Y-PLANE
$LiTaO_3$
(Smith and Welsh)
100 X δv/v
3.60
2.80
2.00
1.20
0.40
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

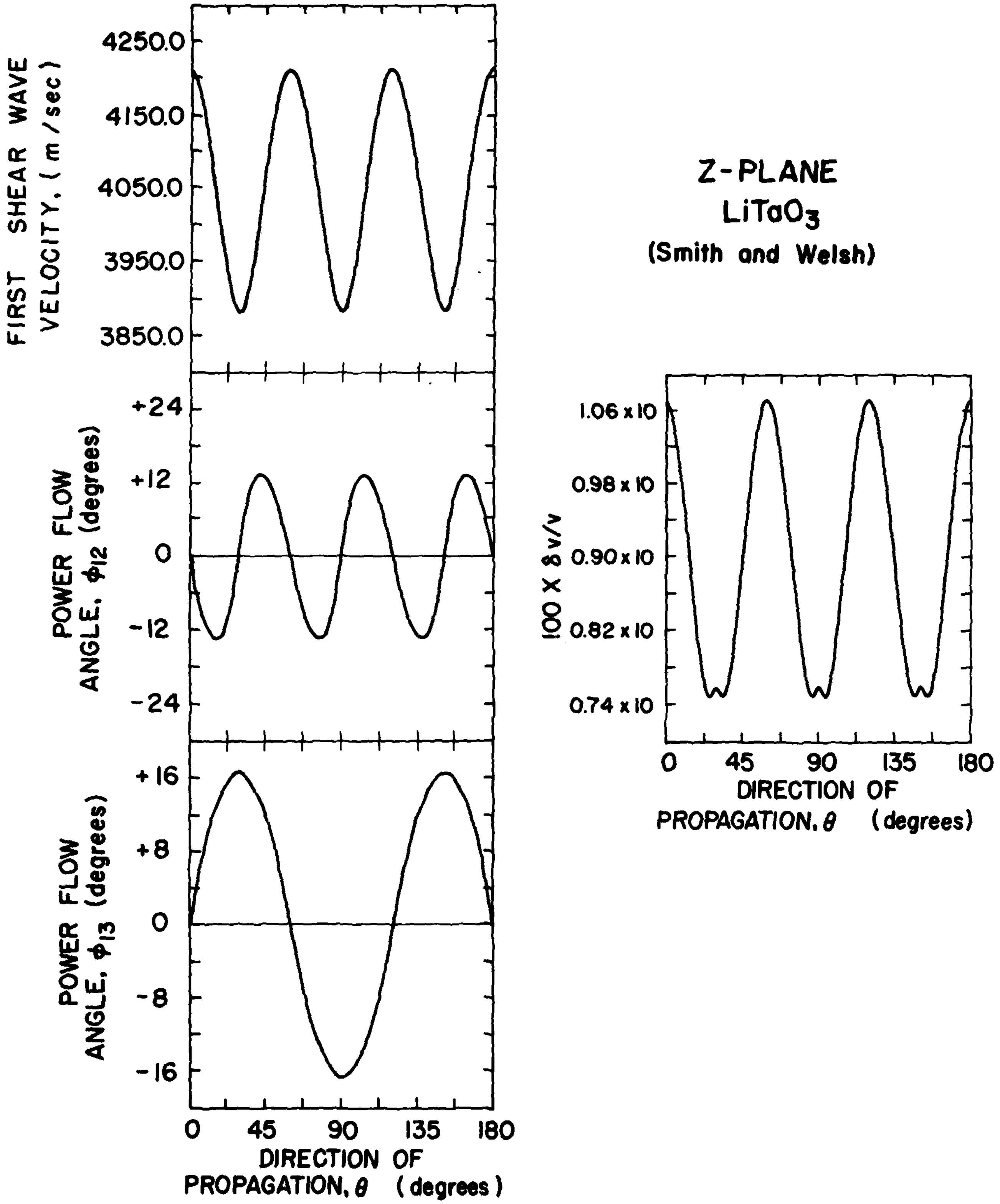

FIRST SHEAR WAVE VELOCITY, (m/sec)
4200.0
4000.0
3800.0
3600.0
3400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+24
+12
0
-12
-24
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Y-PLANE
$LiTaO_3$
(Smith and Welsh)
100 X $\delta v/v$
$1.8 \times 10^{+1}$
$1.4 \times 10^{+1}$
$1.0 \times 10^{+1}$
$0.6 \times 10^{+1}$
$0.2 \times 10^{+1}$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



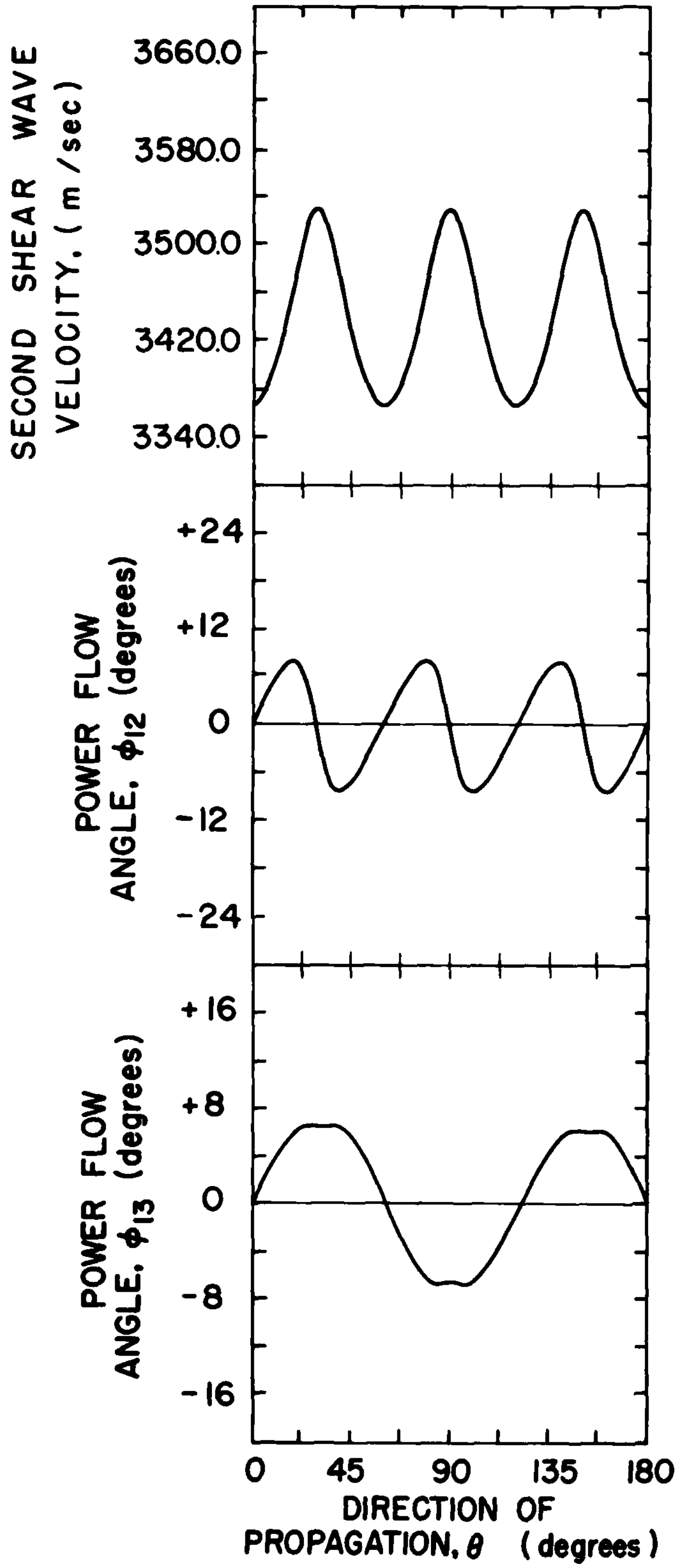
SECOND SHEAR WAVE VELOCITY, (m/sec)
4200.0
4000.0
3800.0
3600.0
3400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+24
+12
0
-12
-24
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Y-PLANE
$LiTaO_3$
(Smith and Welsh)
100 X $\delta v/v$
$1.8 \times 10^{+1}$
$1.4 \times 10^{+1}$
$1.0 \times 10^{+1}$
$0.6 \times 10^{+1}$
$0.2 \times 10^{+1}$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



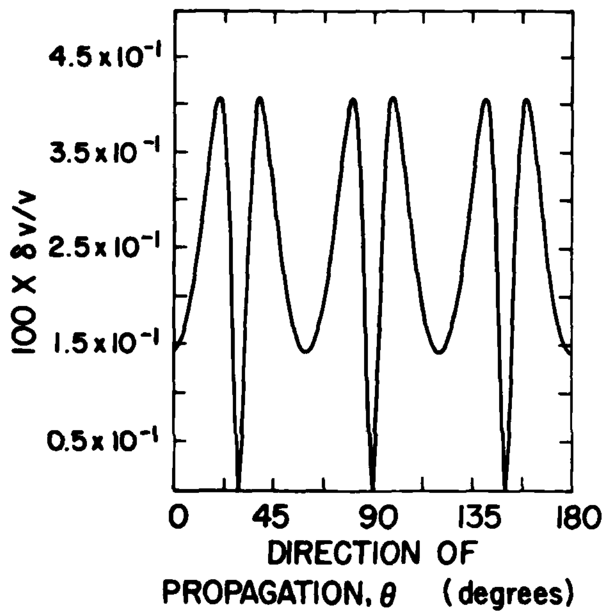
Z-PLANE
$LiTaO_3$
(Smith and Welsh)
LONGITUDINAL WAVE VELOCITY, (m / sec)
5680.0
5640.0
5600.0
5560.0
5520.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
3.60
2.80
2.00
1.20
0.40
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

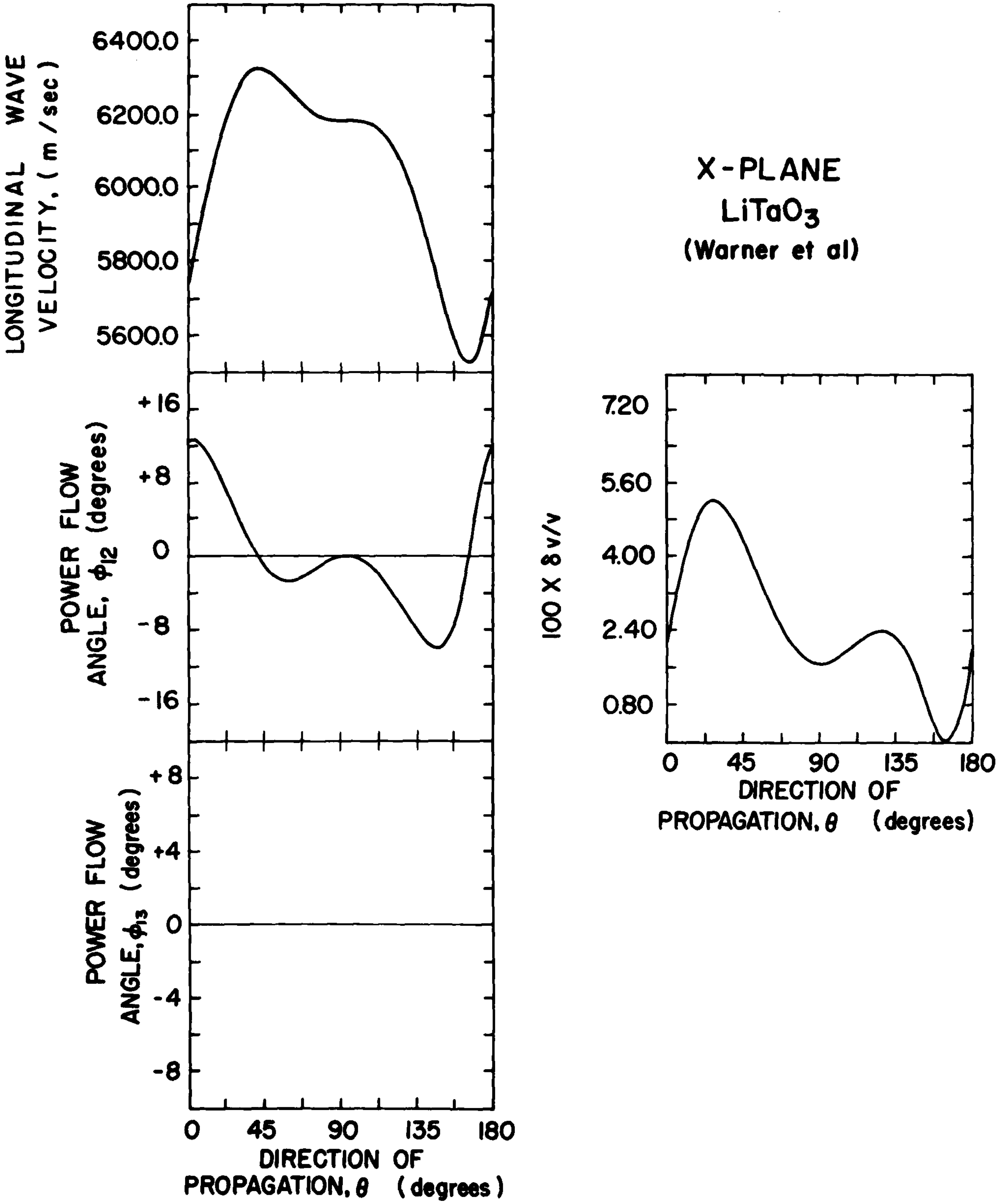


Z-PLANE
$LiTaO_3$
(Smith and Welsh)
FIRST SHEAR WAVE VELOCITY, (m/sec)
4250.0
4150.0
4050.0
3950.0
3850.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
1.06 x 10
0.98 x 10
0.90 x 10
0.82 x 10
0.74 x 10
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

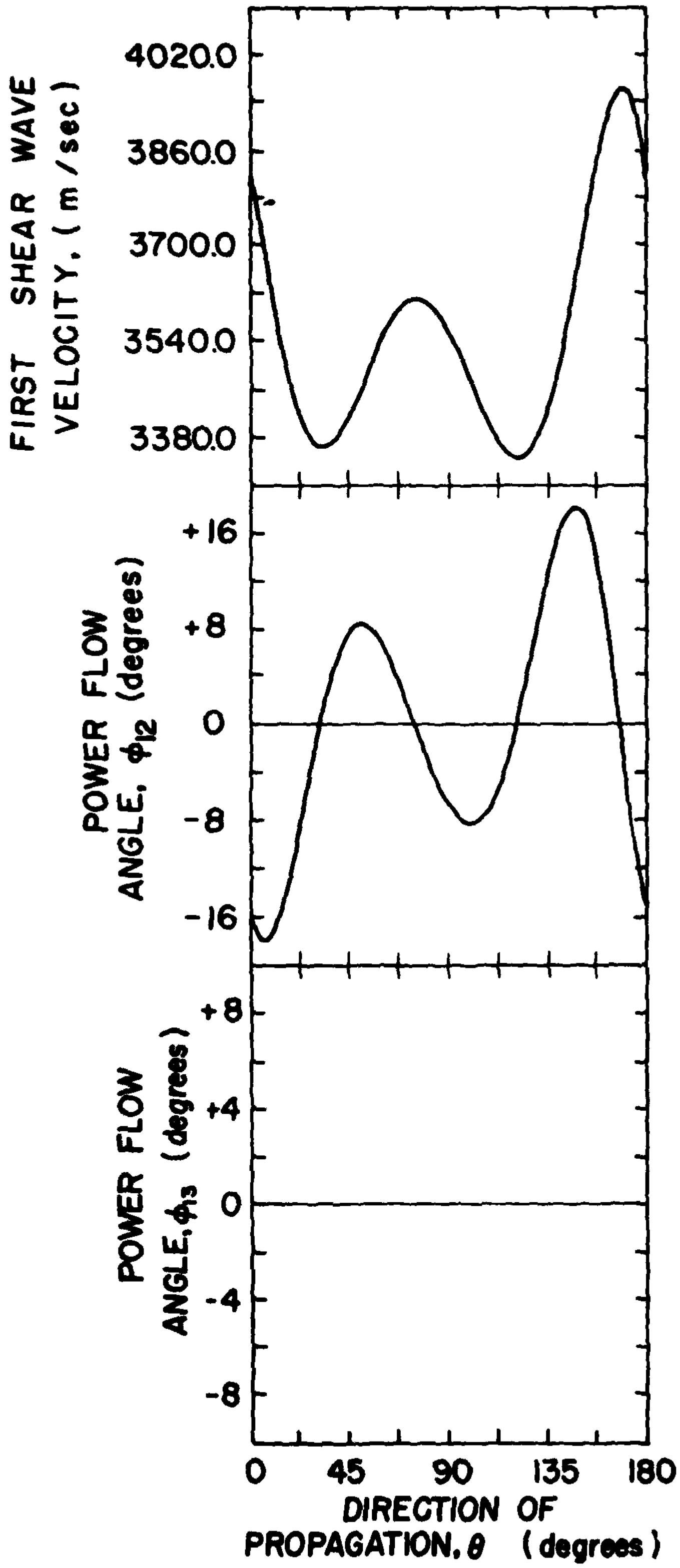


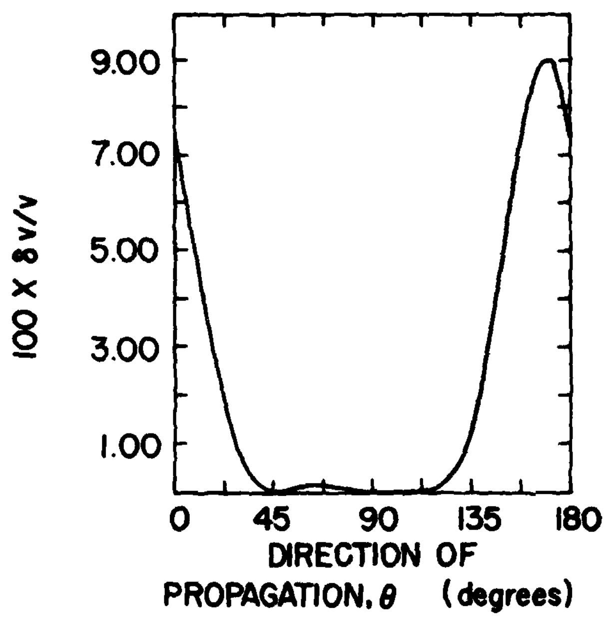
Z-PLANE
$LiTaO_3$
(Smith and Welsh)

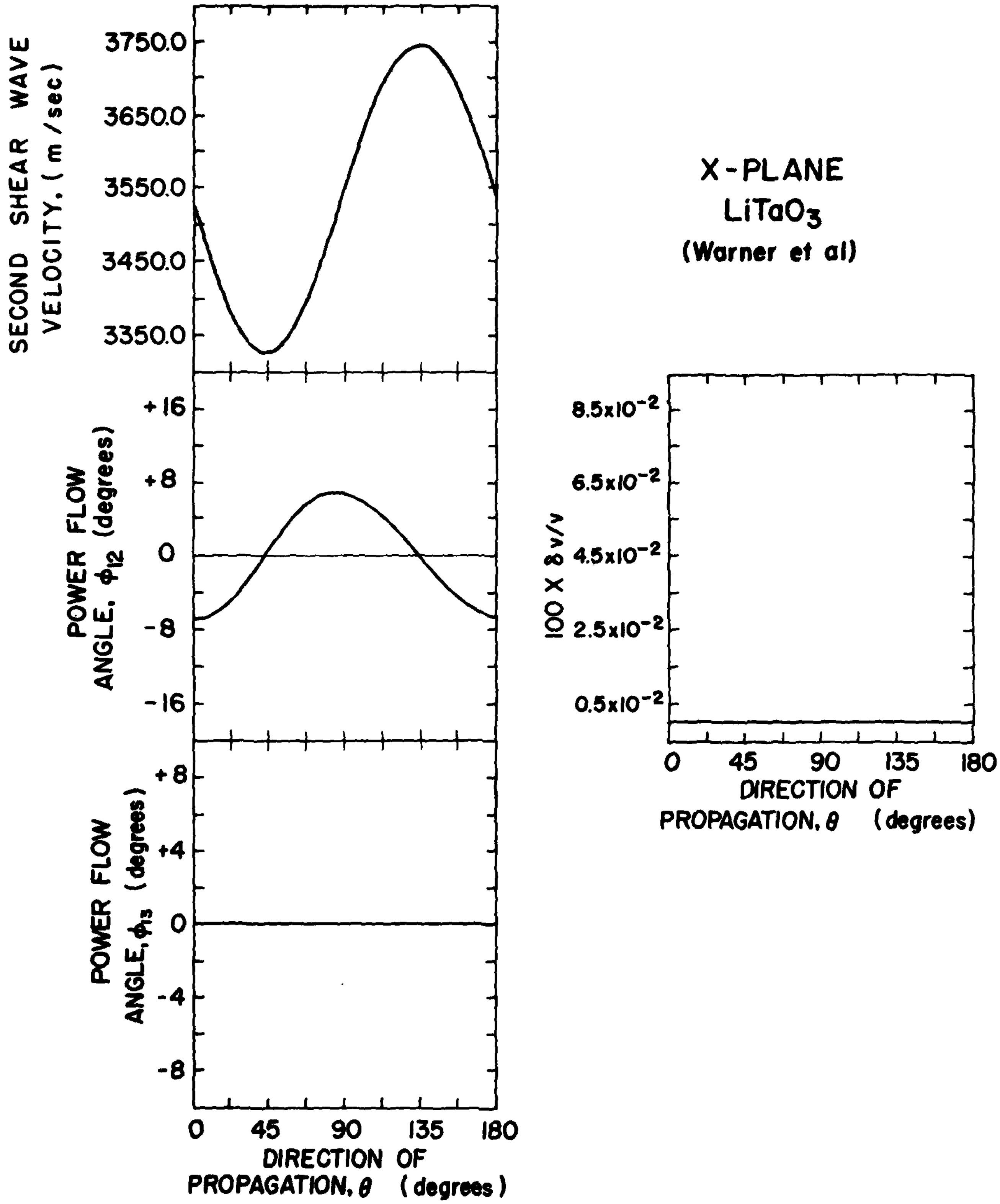




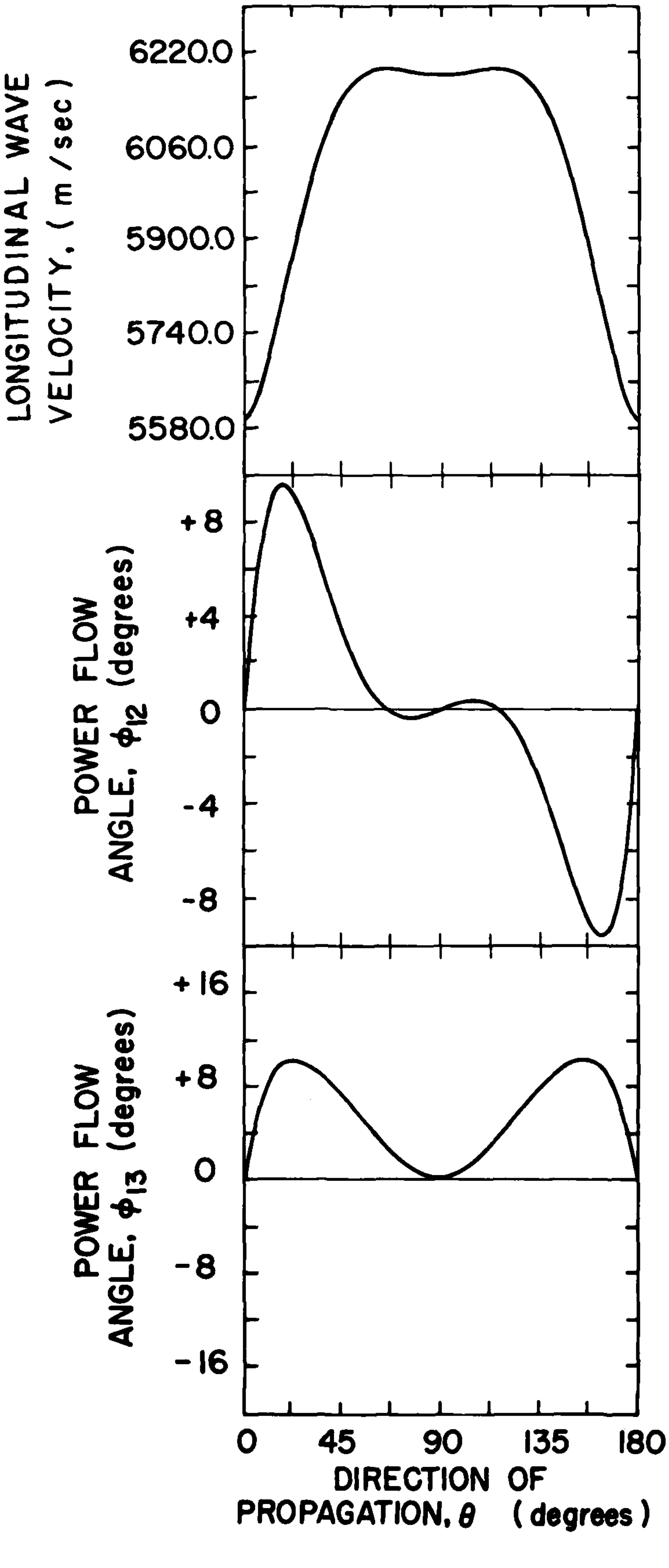
X-PLANE
$LiTaO_3$
(Warner et al)
LONGITUDINAL WAVE VELOCITY, (m/sec)
6400.0
6200.0
6000.0
5800.0
5600.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
7.20
5.60
4.00
2.40
0.80
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


FIRST SHEAR WAVE VELOCITY, (m/sec)
4020.0
3860.0
3700.0
3540.0
3380.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

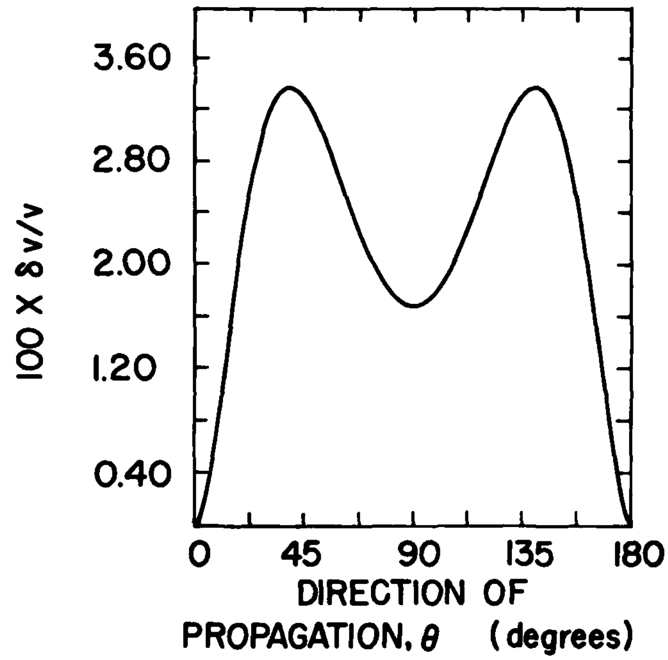

X-PLANE
$LiTaO_3$
(Warner et al)
100 X $\delta v/v$
9.00
7.00
5.00
3.00
1.00
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

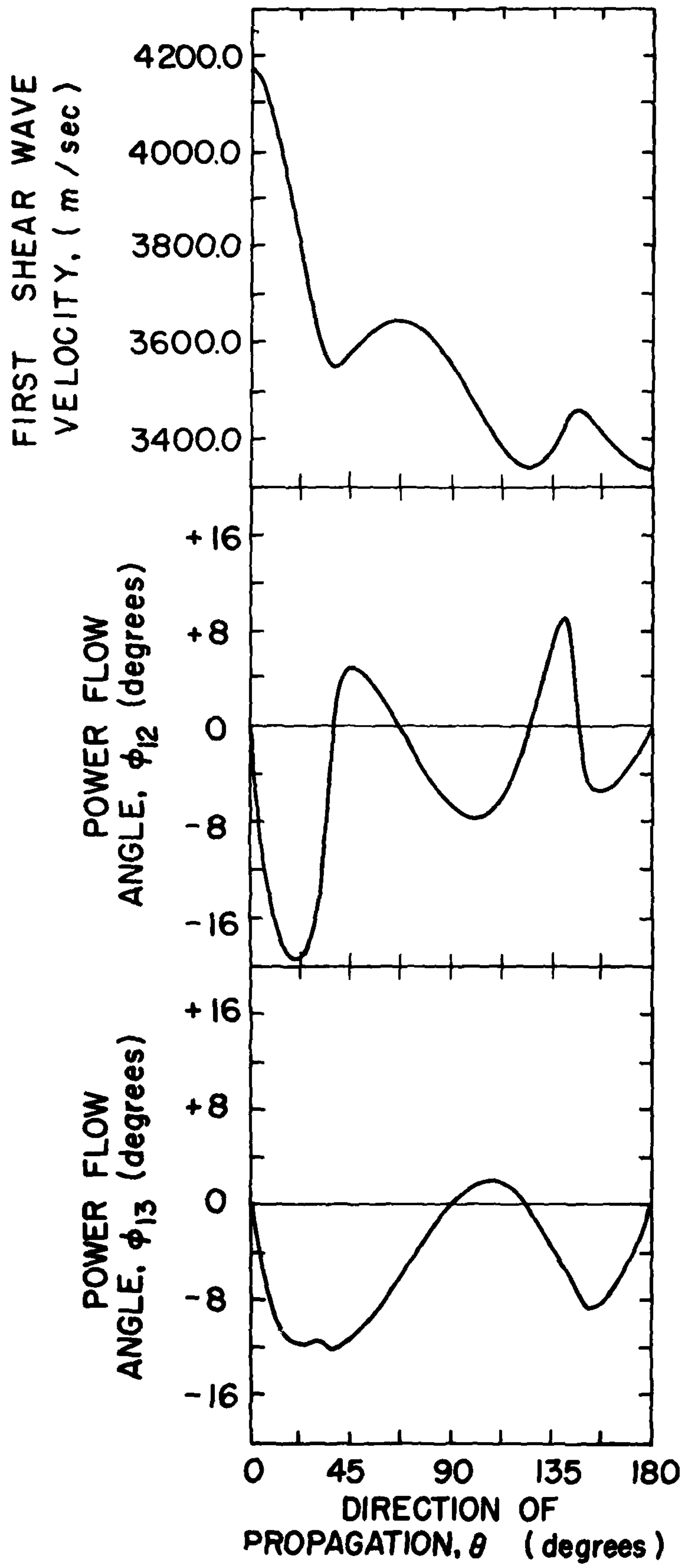


X-PLANE
$LiTaO_3$
(Warner et al)
SECOND SHEAR WAVE VELOCITY, (m/sec)
3750.0
3650.0
3550.0
3450.0
3350.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



Y-PLANE
$LiTaO_3$
(Warner et al)

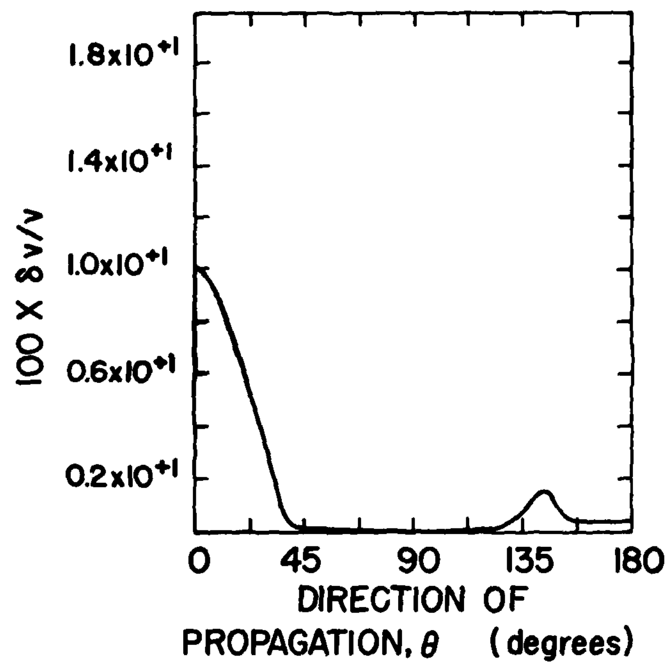


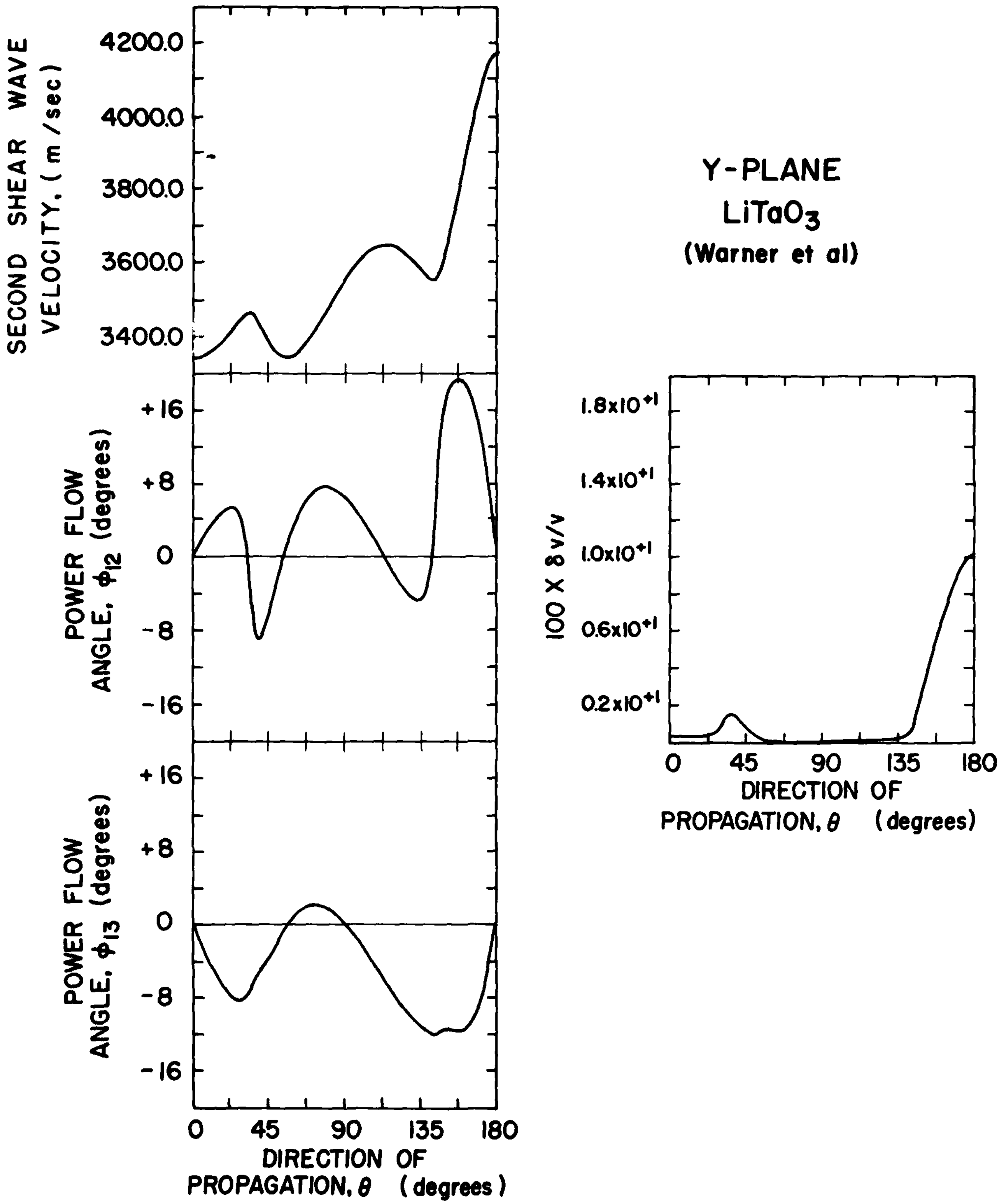


Y-PLANE

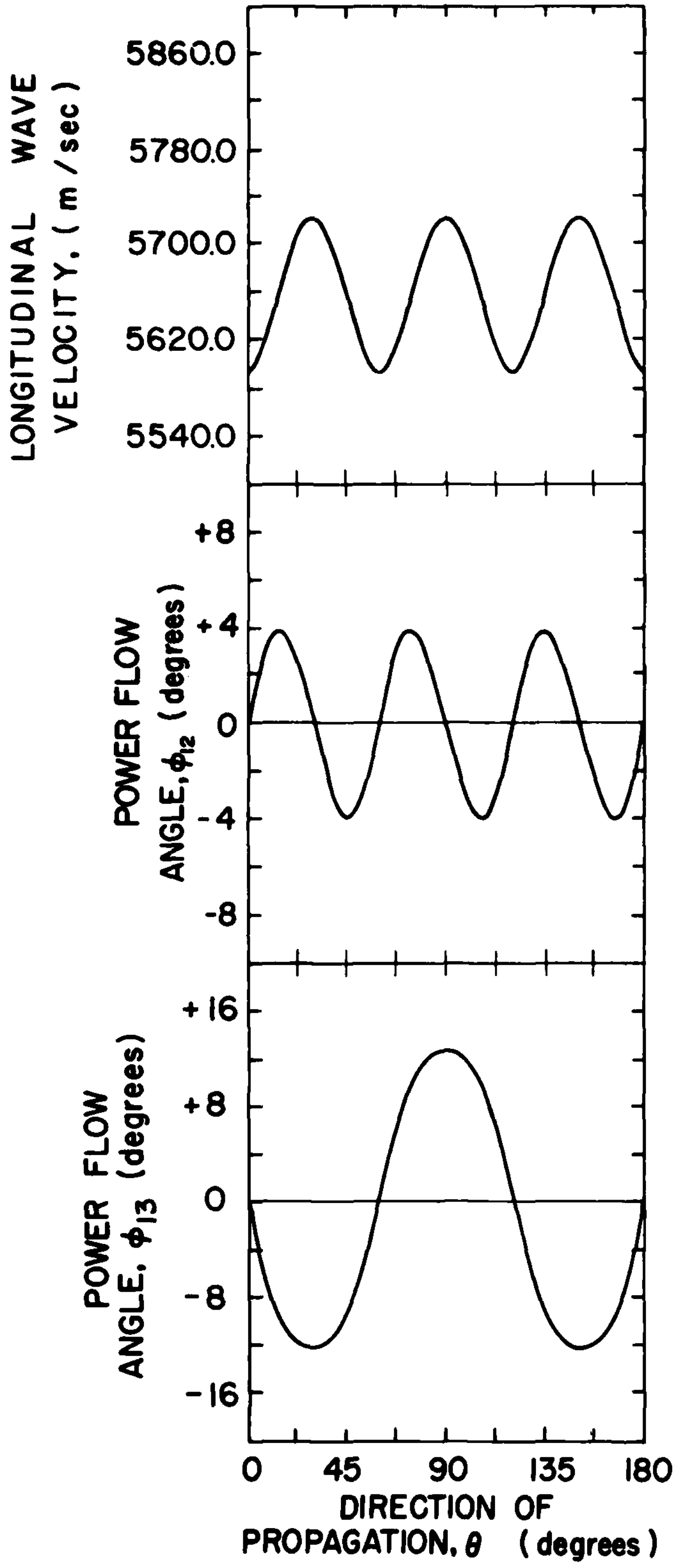
$LiTaO_3$

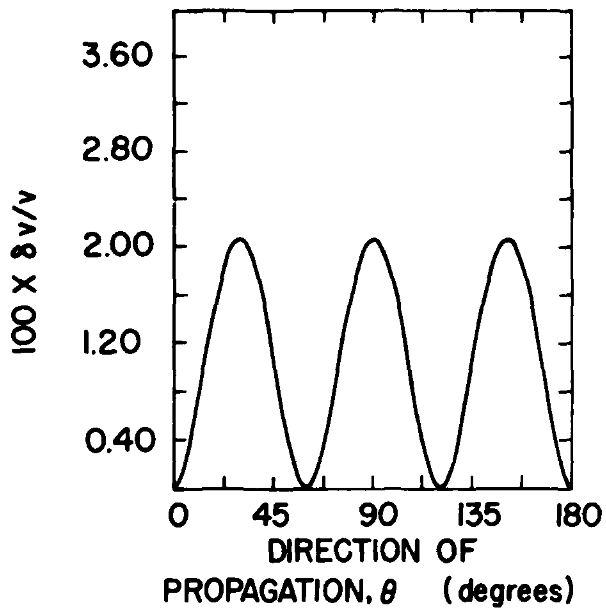
(Warner et al)

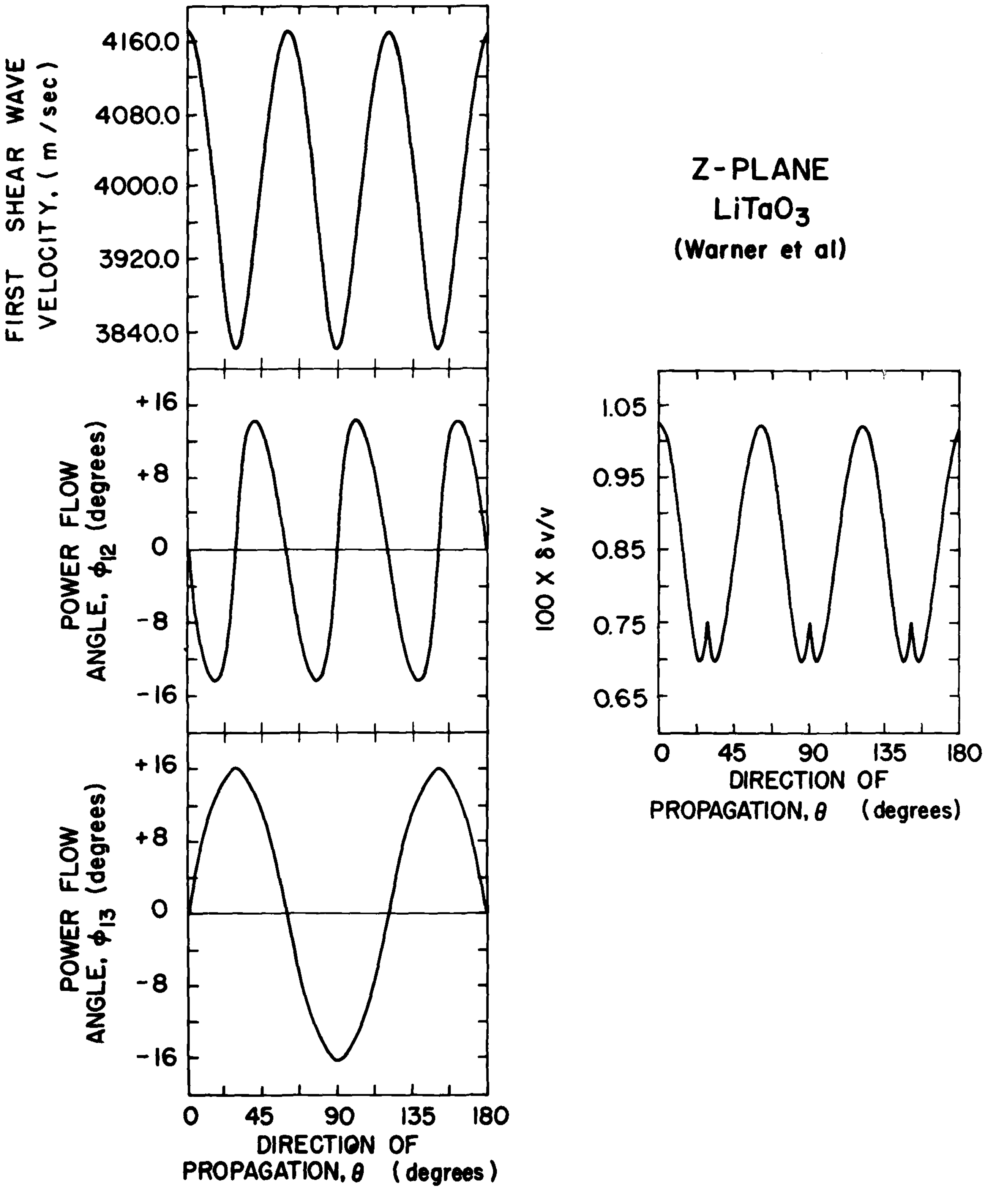



SECOND SHEAR WAVE VELOCITY, (m/sec)
4200.0
4000.0
3800.0
3600.0
3400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Y-PLANE
$LiTaO_3$
(Warner et al)
$1.8 \times 10^{+1}$
$1.4 \times 10^{+1}$
$1.0 \times 10^{+1}$
$0.6 \times 10^{+1}$
$0.2 \times 10^{+1}$
$100 \times \delta v/v$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

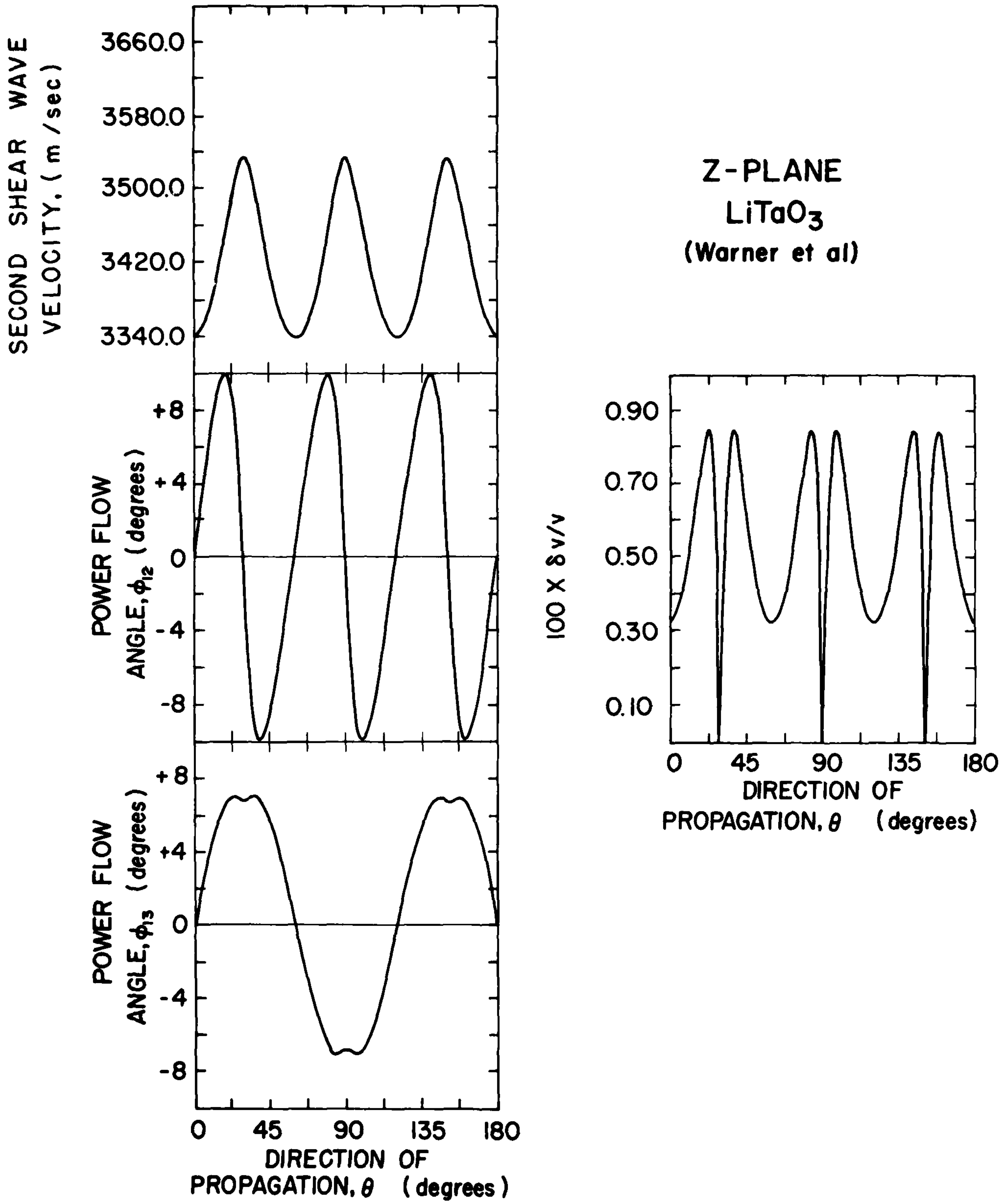
Z-PLANE
$LiTaO_3$
(Warner et al)



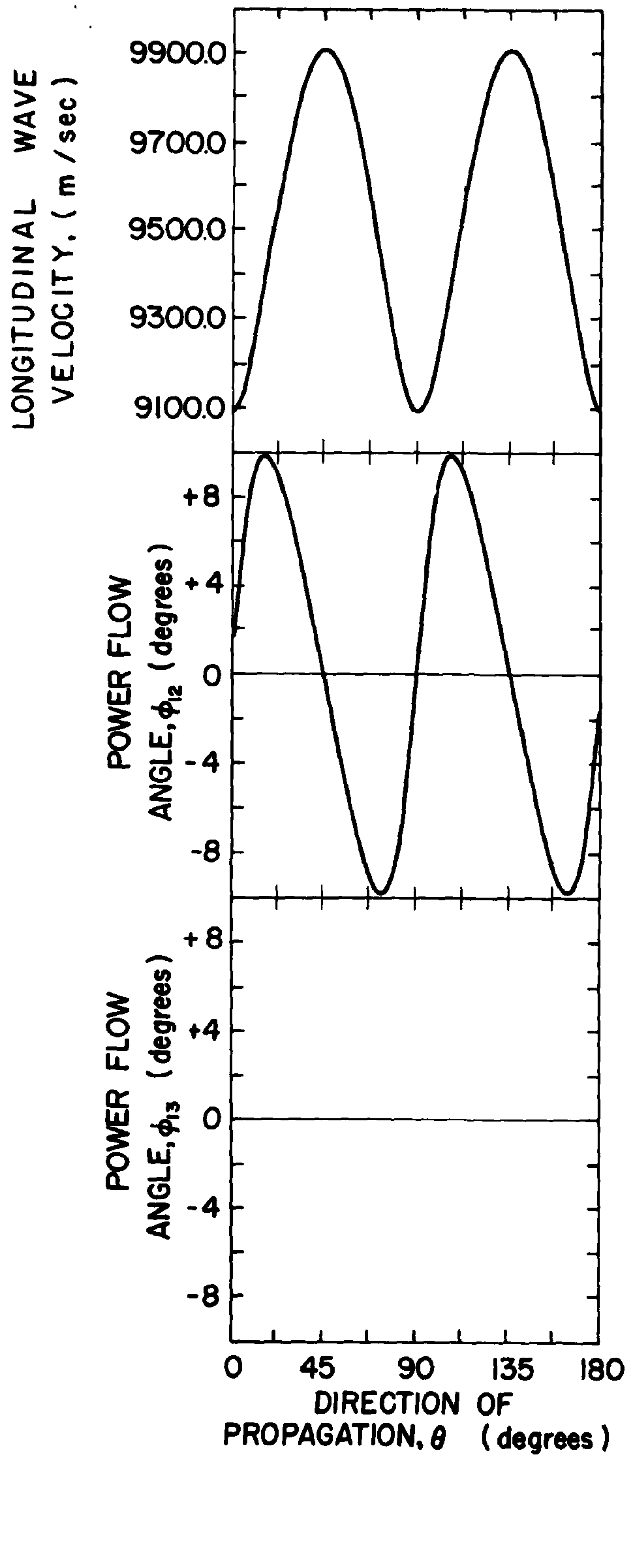




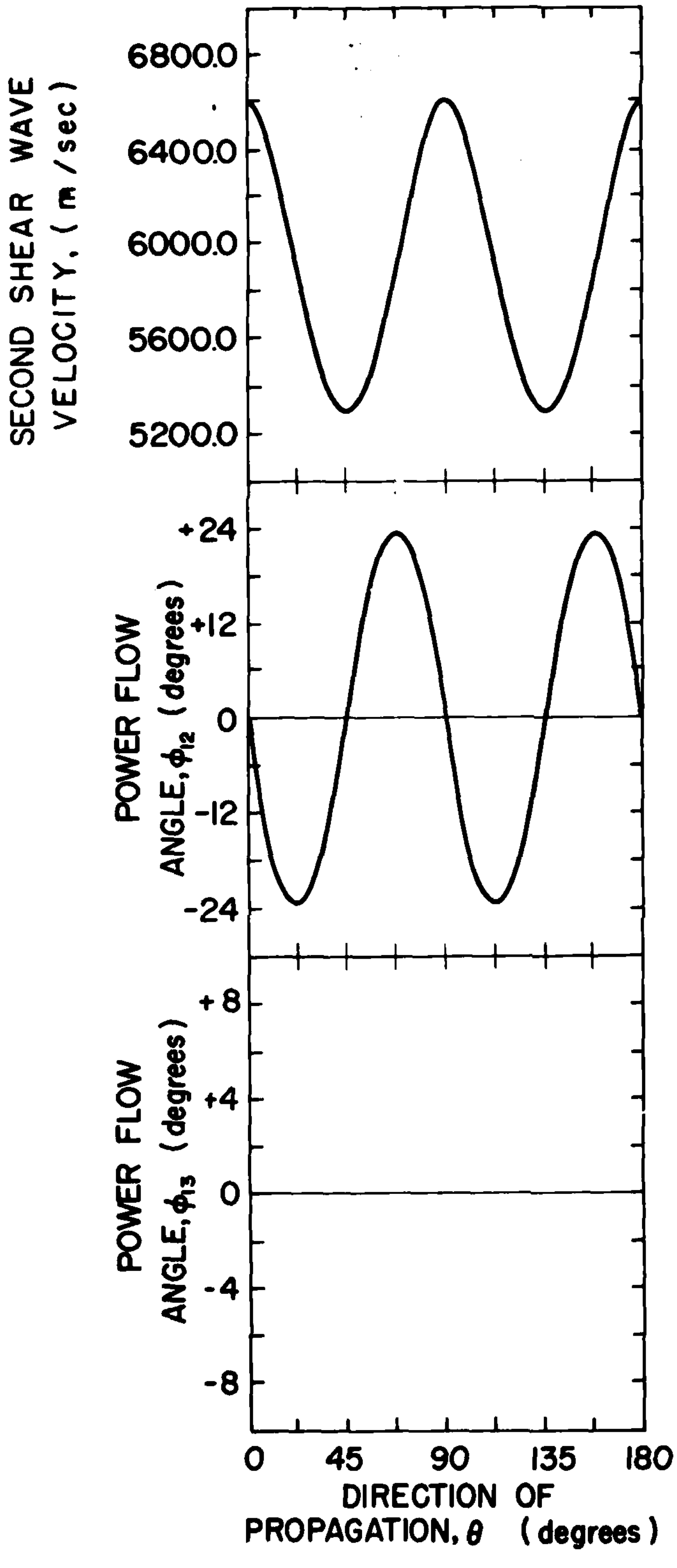
FIRST SHEAR WAVE VELOCITY, (m / sec)
4160.0
4080.0
4000.0
3920.0
3840.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
$LiTaO_3$
(Warner et al)
100 X $\delta v/v$
1.05
0.95
0.85
0.75
0.65



Z-PLANE
LiTaO3
(Warner et al)
SECOND SHEAR WAVE VELOCITY, (m/sec)
3660.0
3580.0
3500.0
3420.0
3340.0
POWER FLOW ANGLE, φ12 (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, φ13 (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
100 X δv/v
0.90
0.70
0.50
0.30
0.10
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

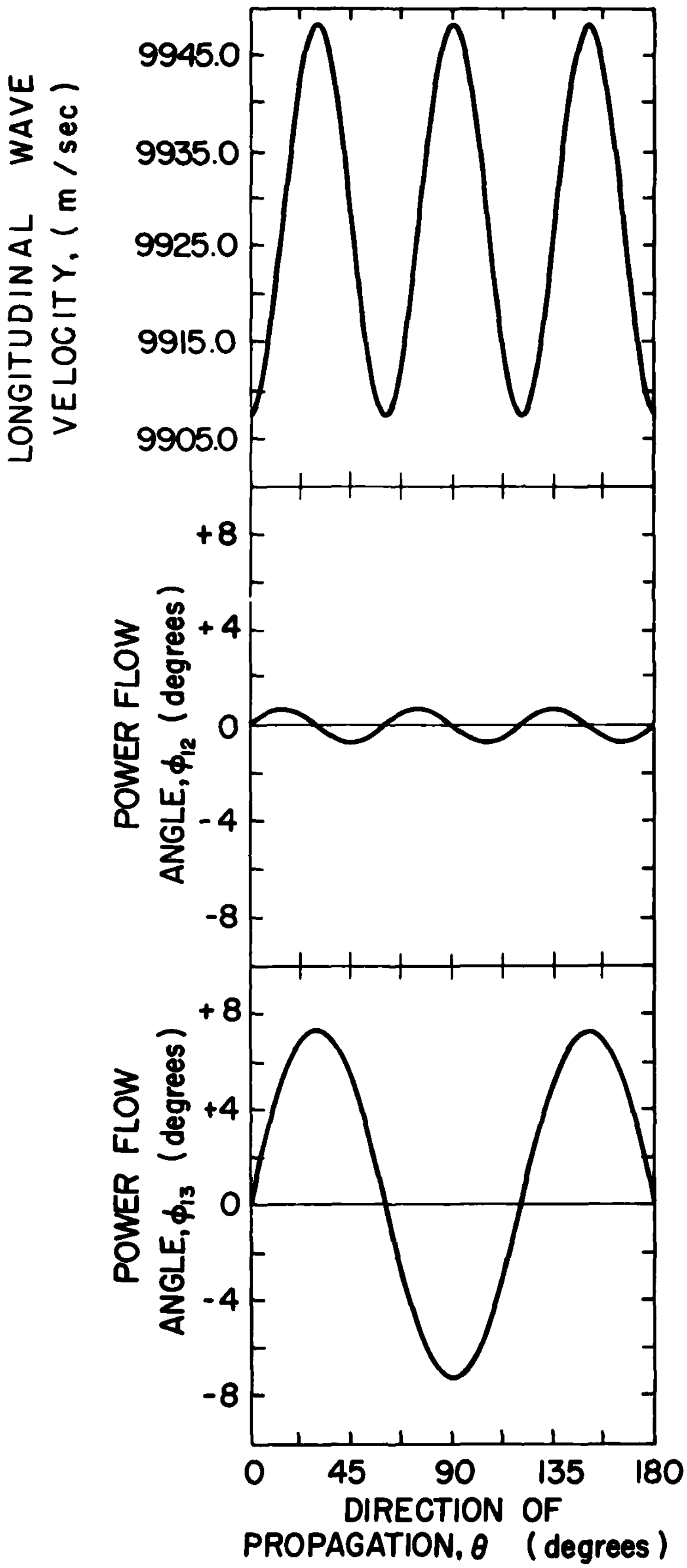

LONGITUDINAL WAVE VELOCITY, (m /sec)
9900.0
9700.0
9500.0
9300.0
9100.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

Z-PLANE
MgO

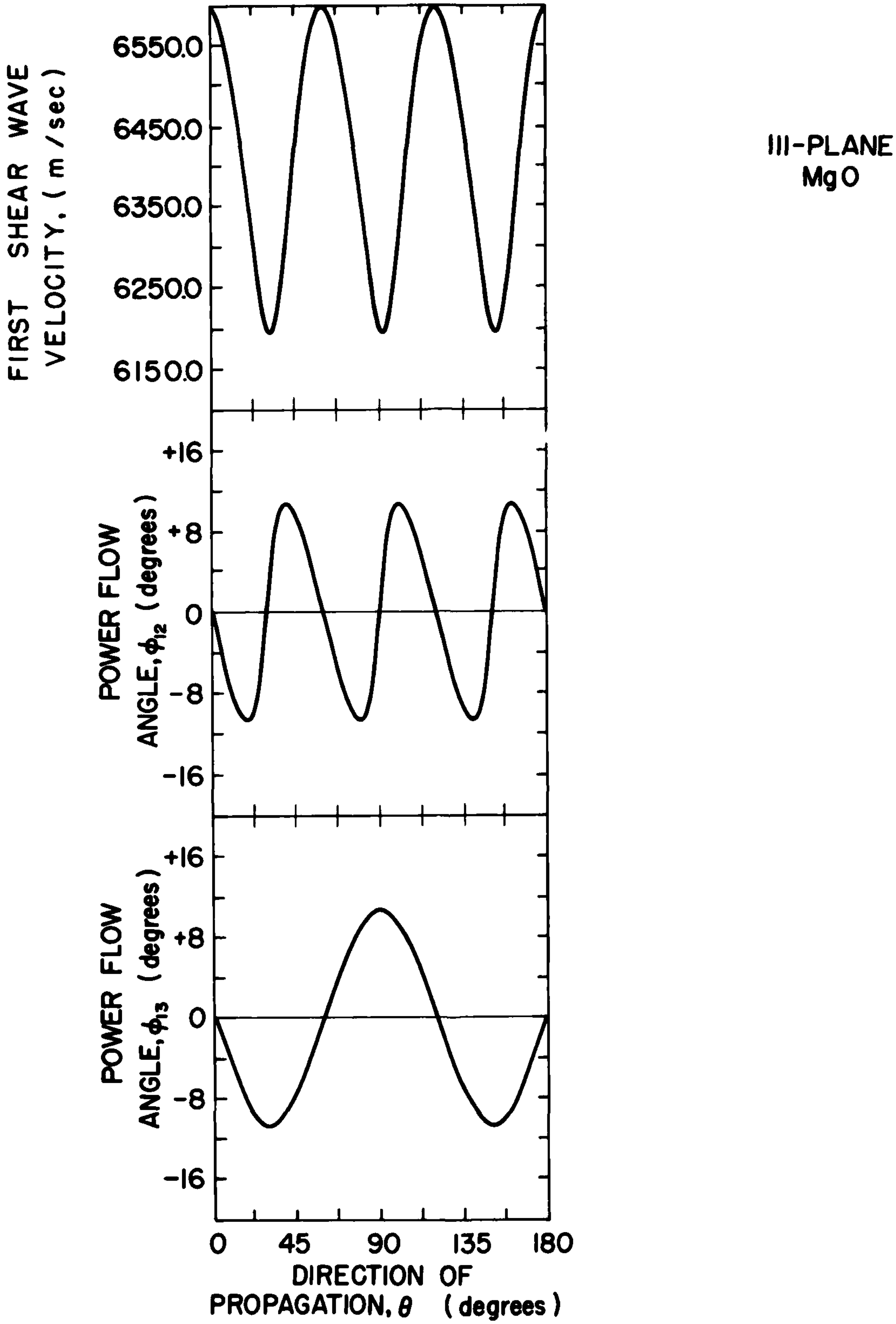


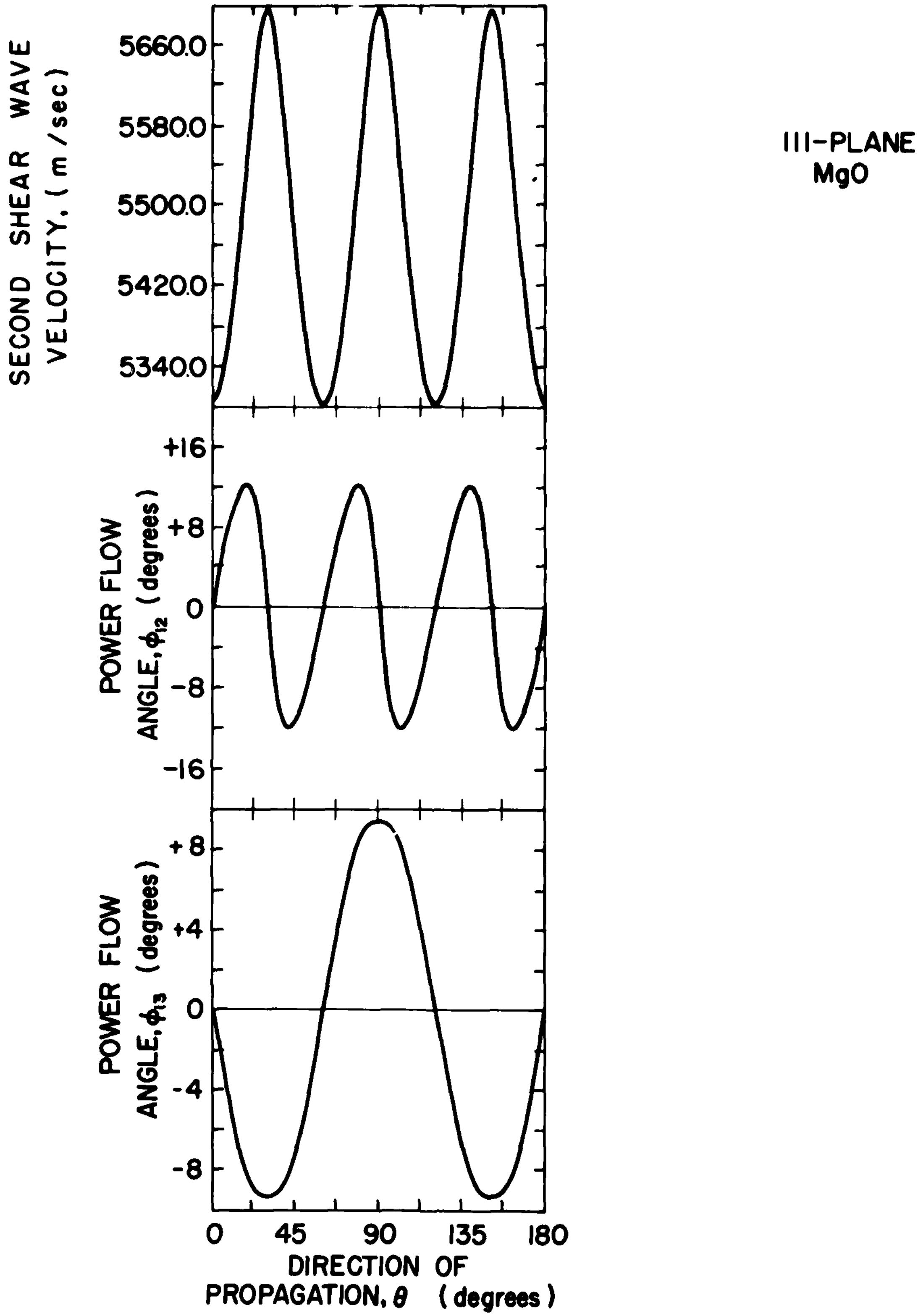
SECOND SHEAR WAVE
VELOCITY, (m/sec)
6800.0
6400.0
6000.0
5600.0
5200.0
POWER FLOW
ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW
ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF
PROPAGATION, θ (degrees)

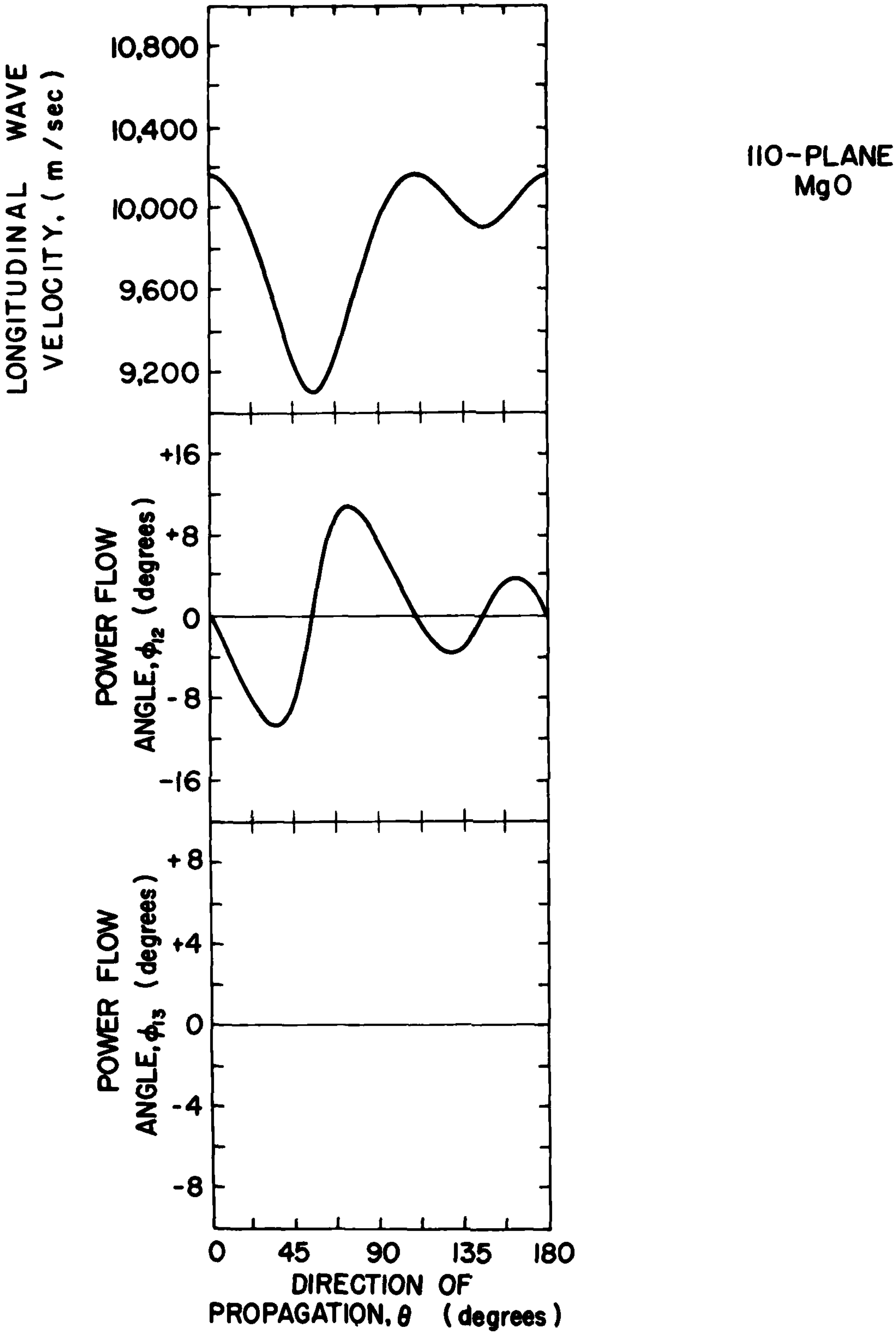
Z-PLANE
MgO



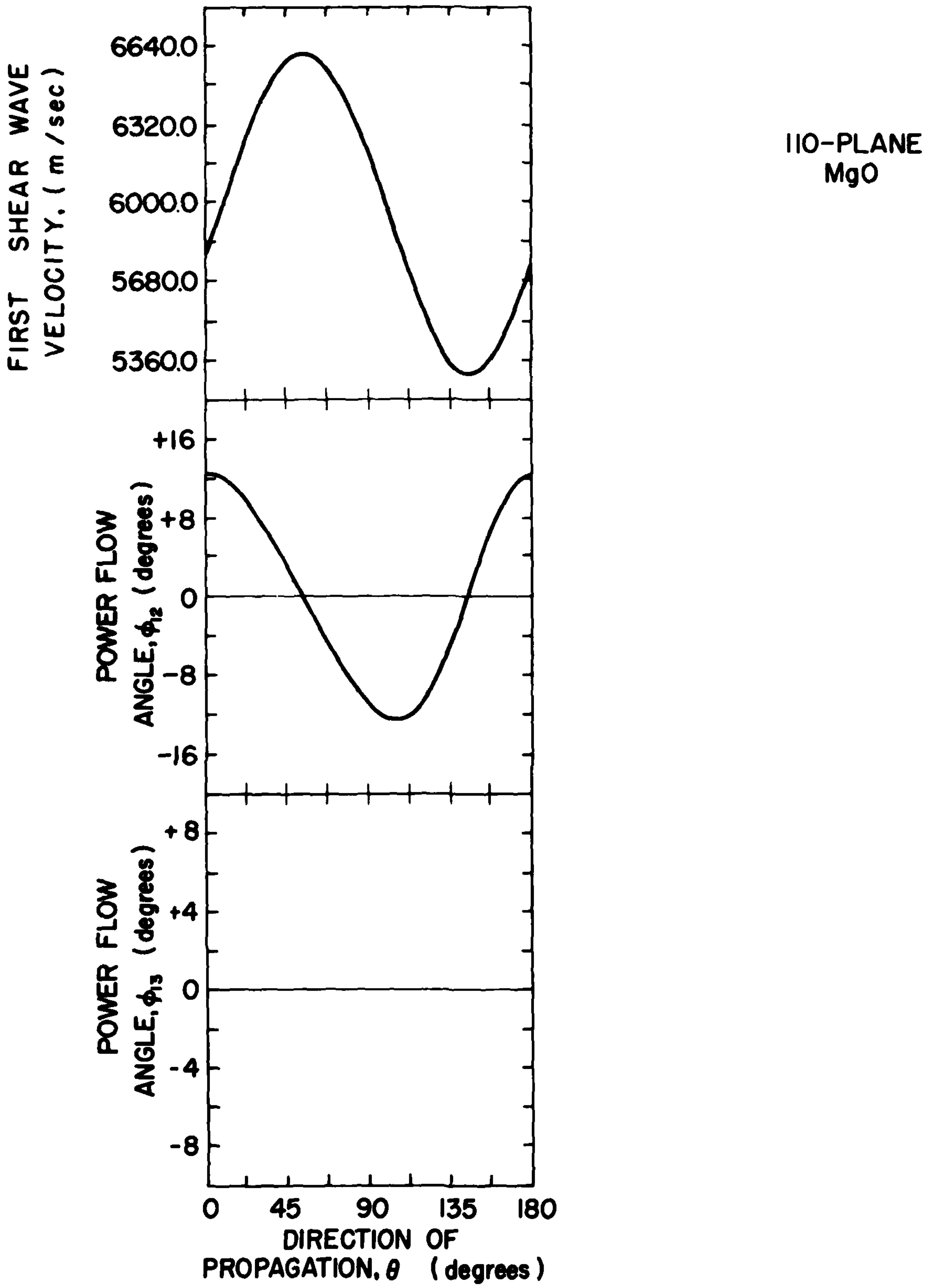
111 - PLANE
MgO

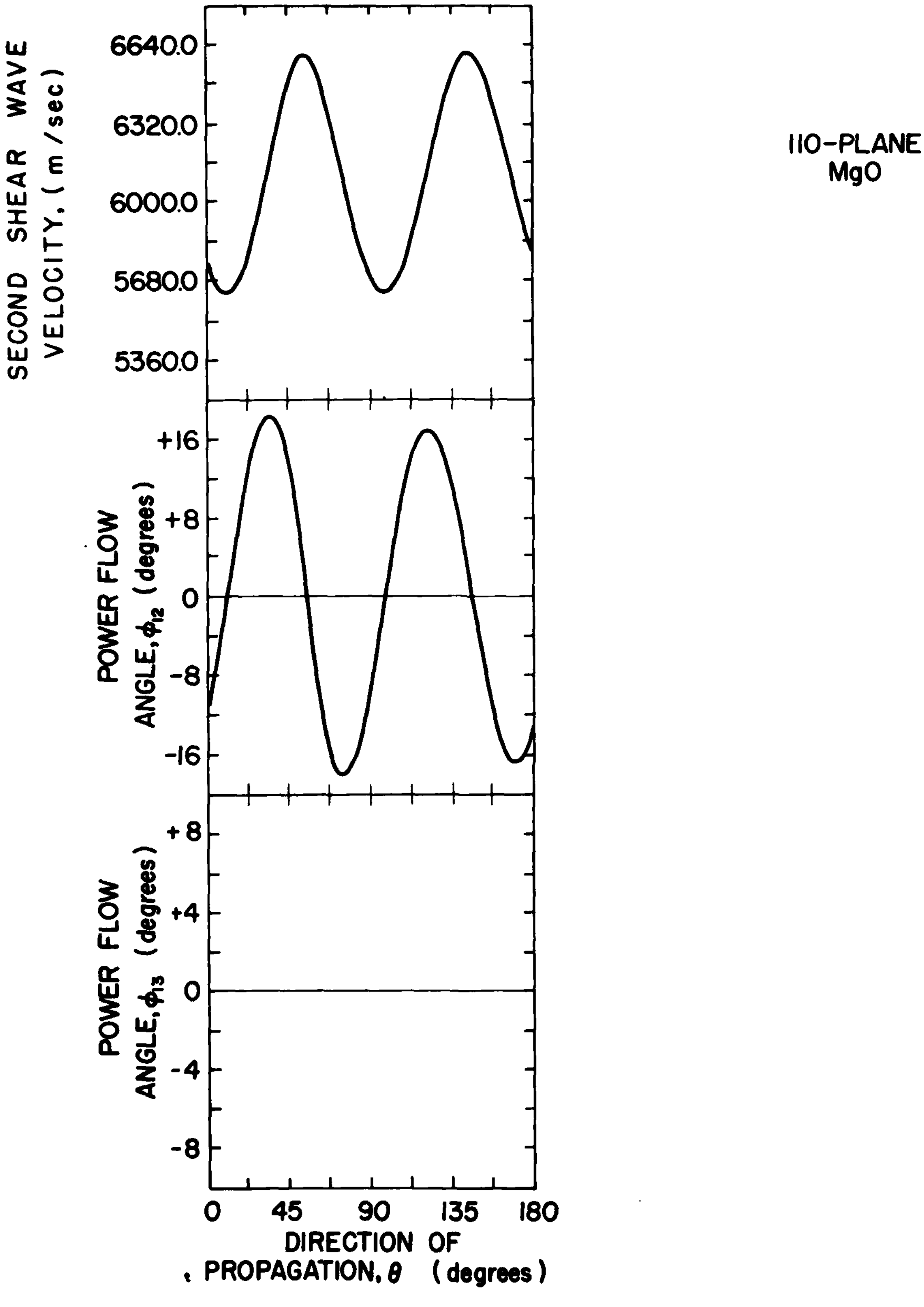

FIRST SHEAR WAVE VELOCITY, (m/sec)
6550.0
6450.0
6350.0
6250.0
6150.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
III-PLANE
MgO


SECOND SHEAR WAVE VELOCITY, (m/sec)
5660.0
5580.0
5500.0
5420.0
5340.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
MgO

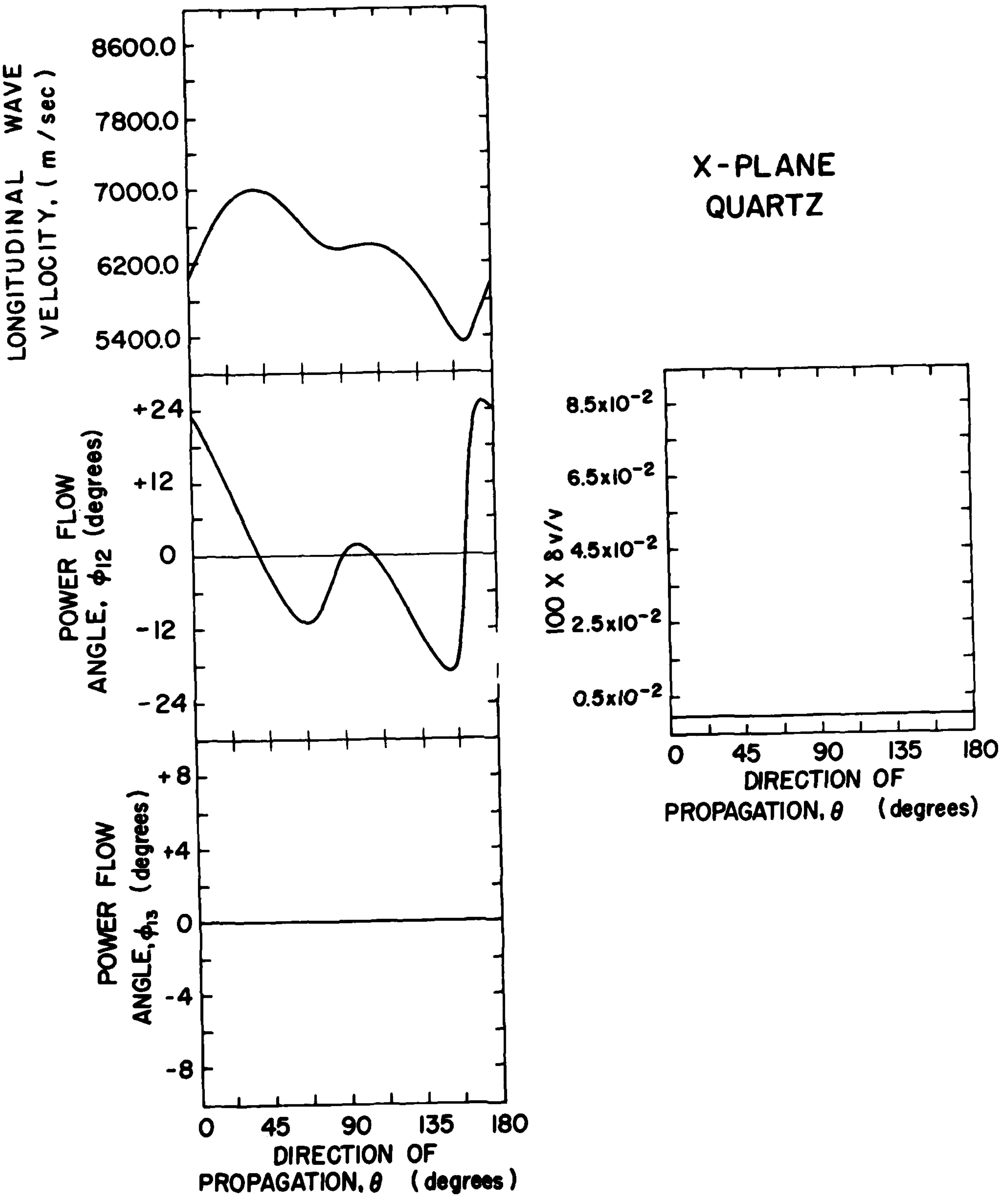


LONGITUDINAL WAVE VELOCITY, (m / sec)
10,800
10,400
10,000
9,600
9,200
110-PLANE
MgO
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


FIRST SHEAR WAVE VELOCITY, (m/sec)
6640.0
6320.0
6000.0
5680.0
5360.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE
MgO

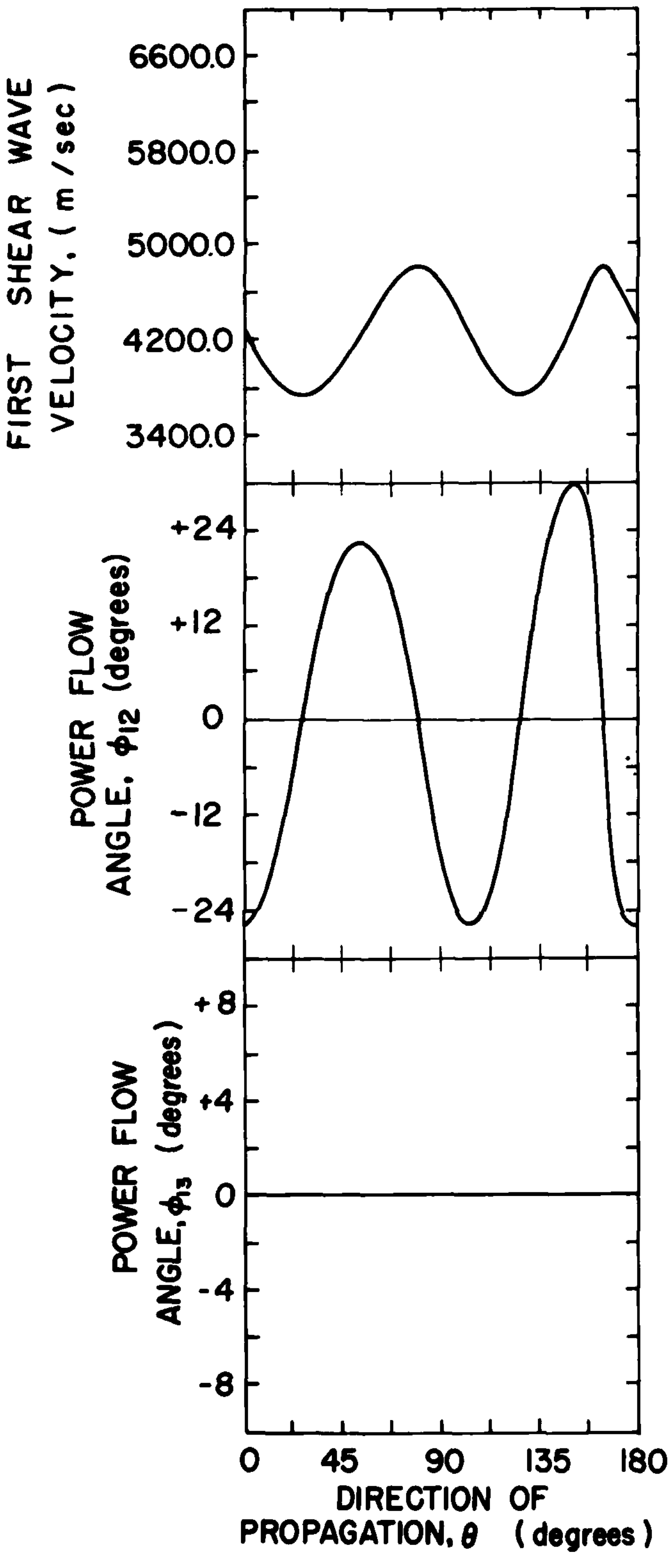


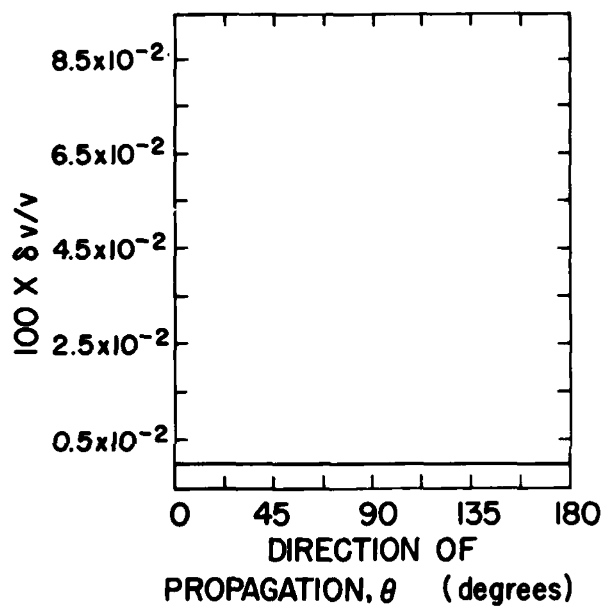
SECOND SHEAR WAVE VELOCITY, (m / sec)
6640.0
6320.0
6000.0
5680.0
5360.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE
MgO

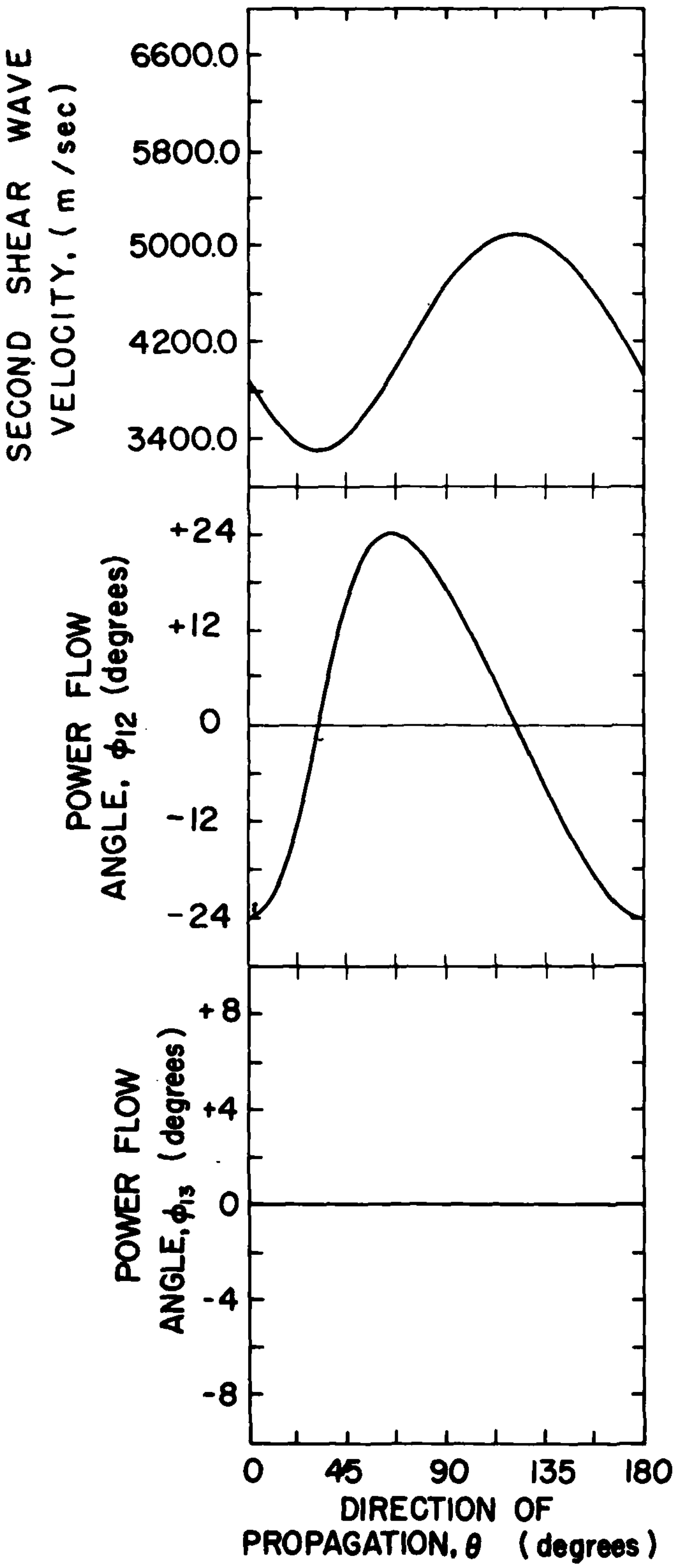


LONGITUDINAL WAVE VELOCITY, (m / sec)
8600.0
7800.0
7000.0
6200.0
5400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
X-PLANE
QUARTZ
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

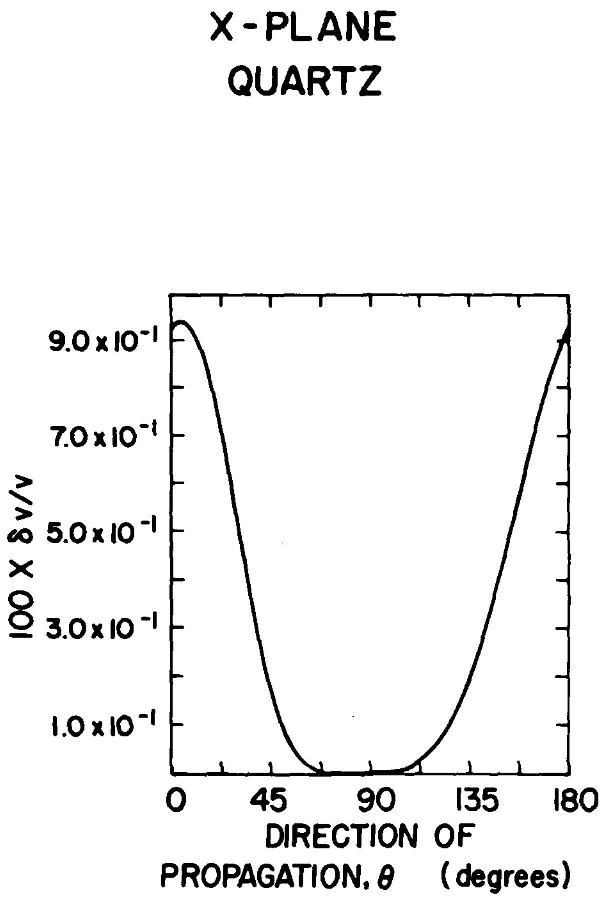
X-PLANE
QUARTZ



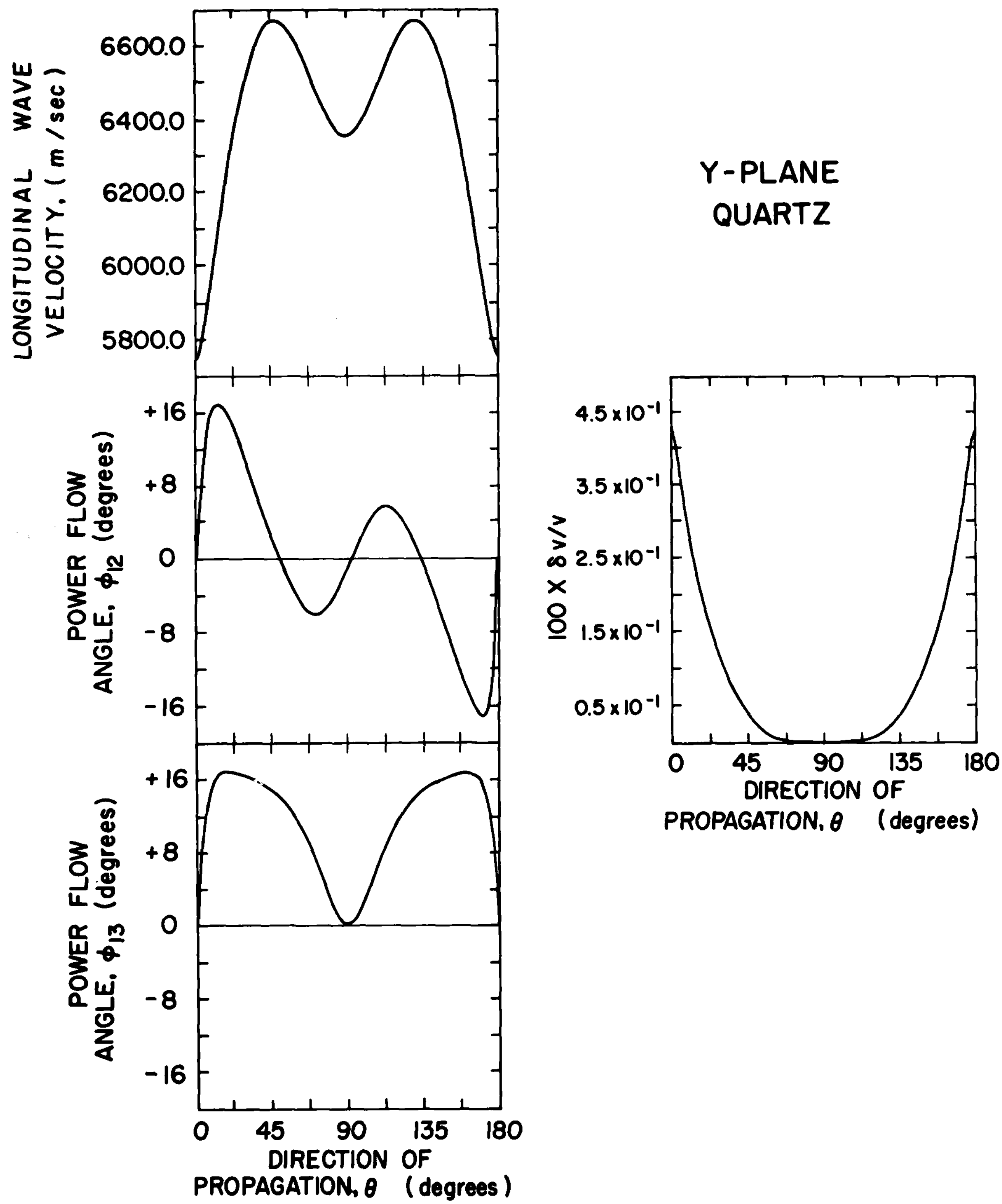




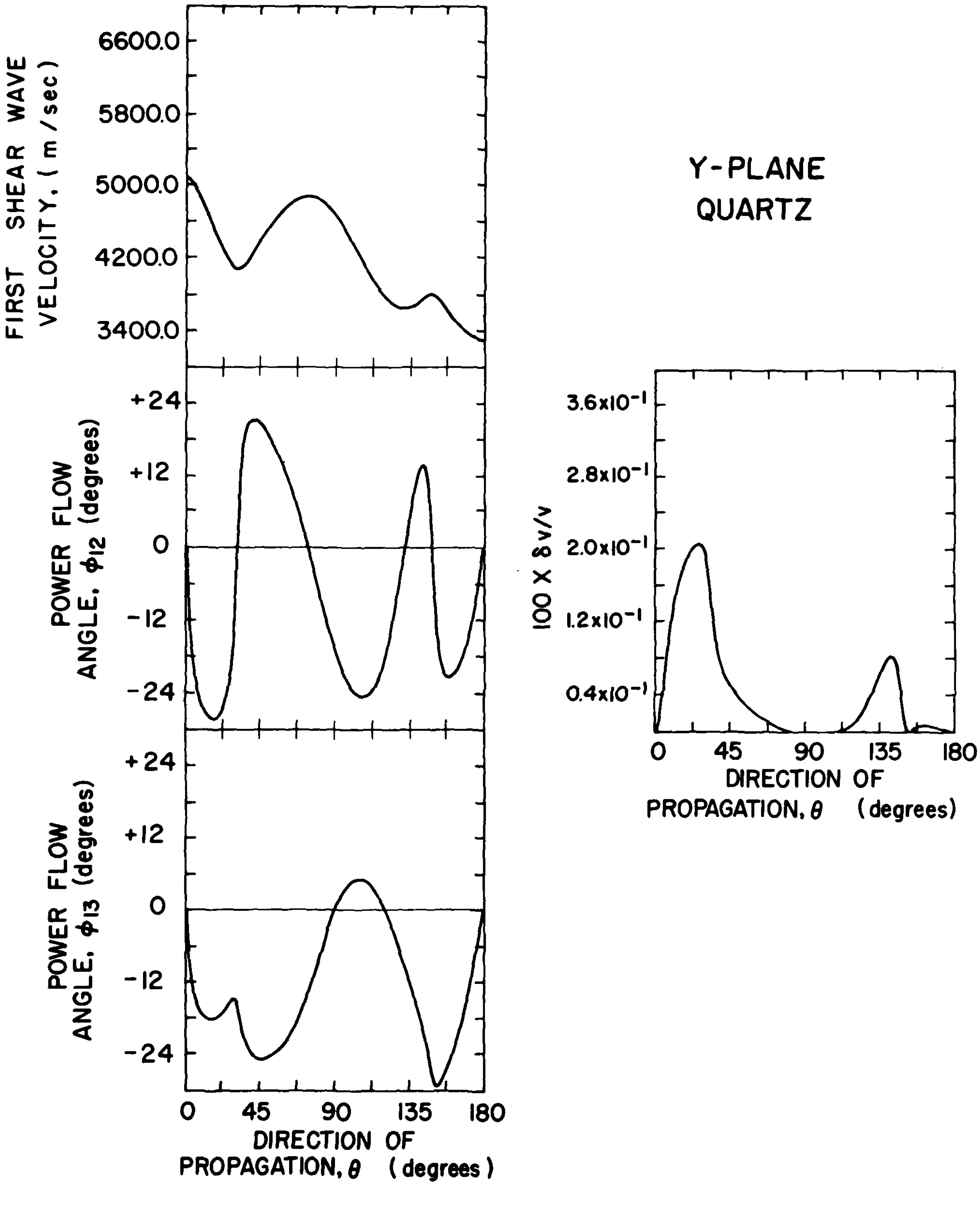
SECOND SHEAR WAVE VELOCITY, (m/sec)
6600.0
5800.0
5000.0
4200.0
3400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



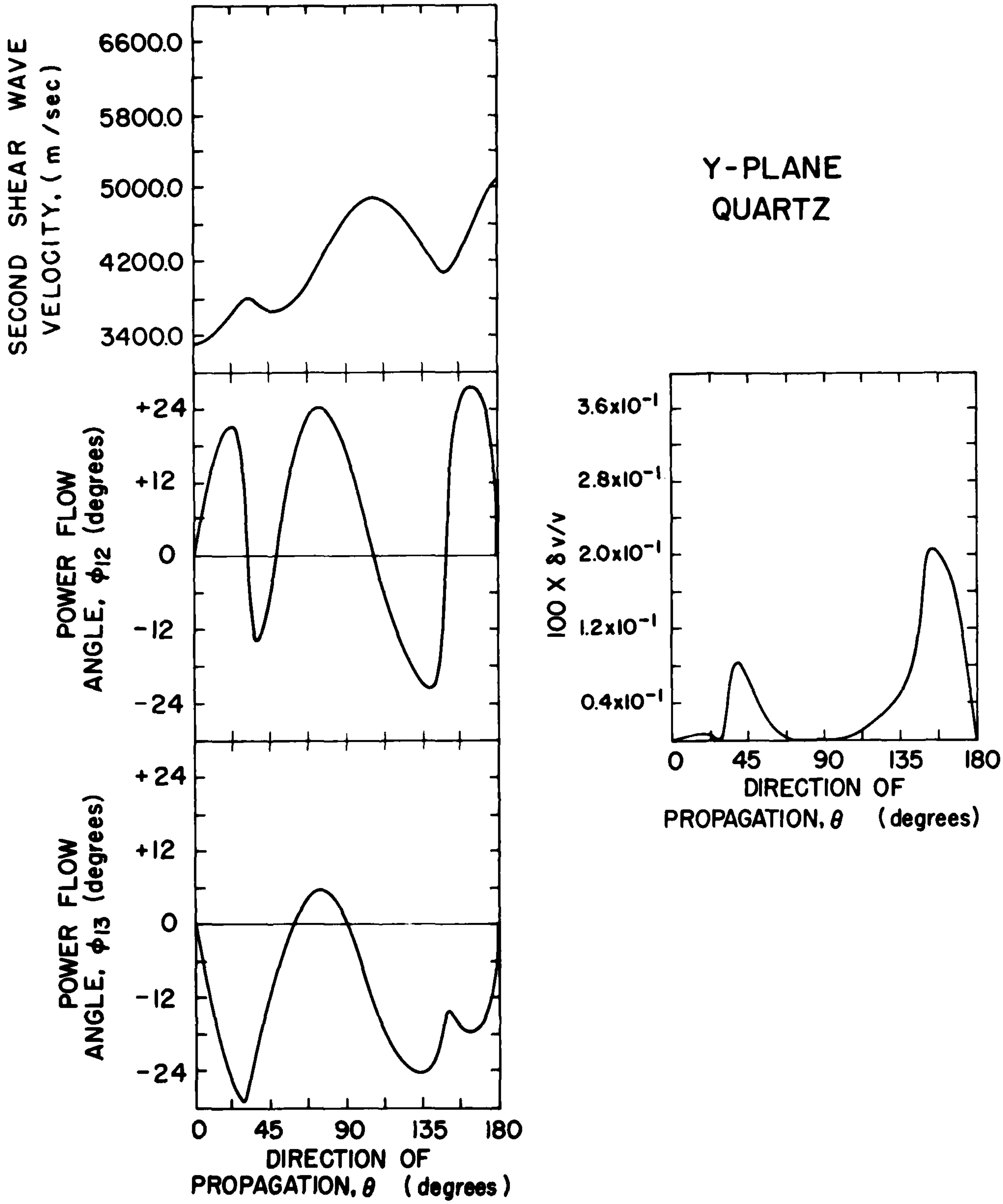
X-PLANE QUARTZ
9.0×10^{-1}
7.0×10^{-1}
5.0×10^{-1}
3.0×10^{-1}
1.0×10^{-1}
100 X $\delta v/v$
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

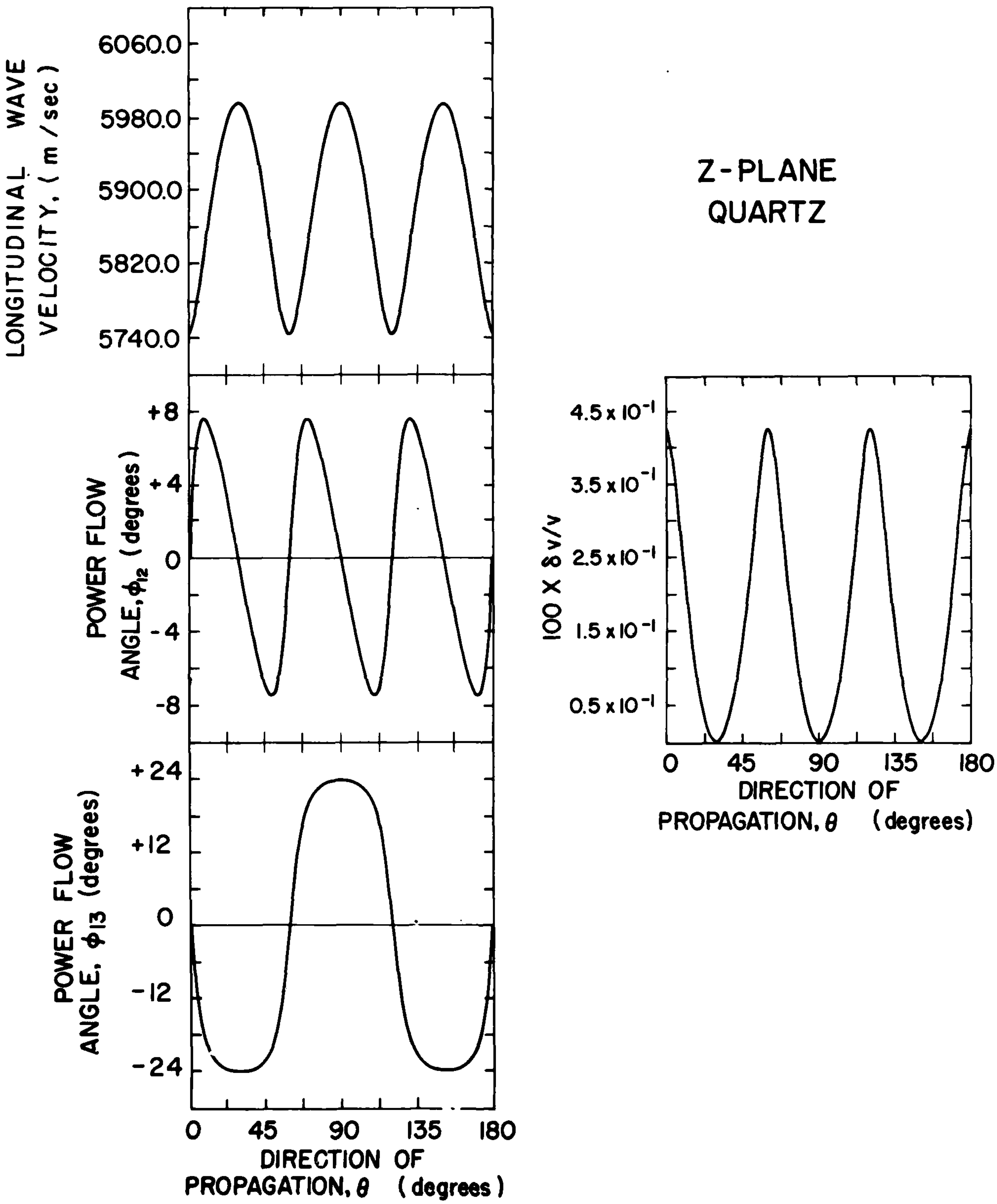


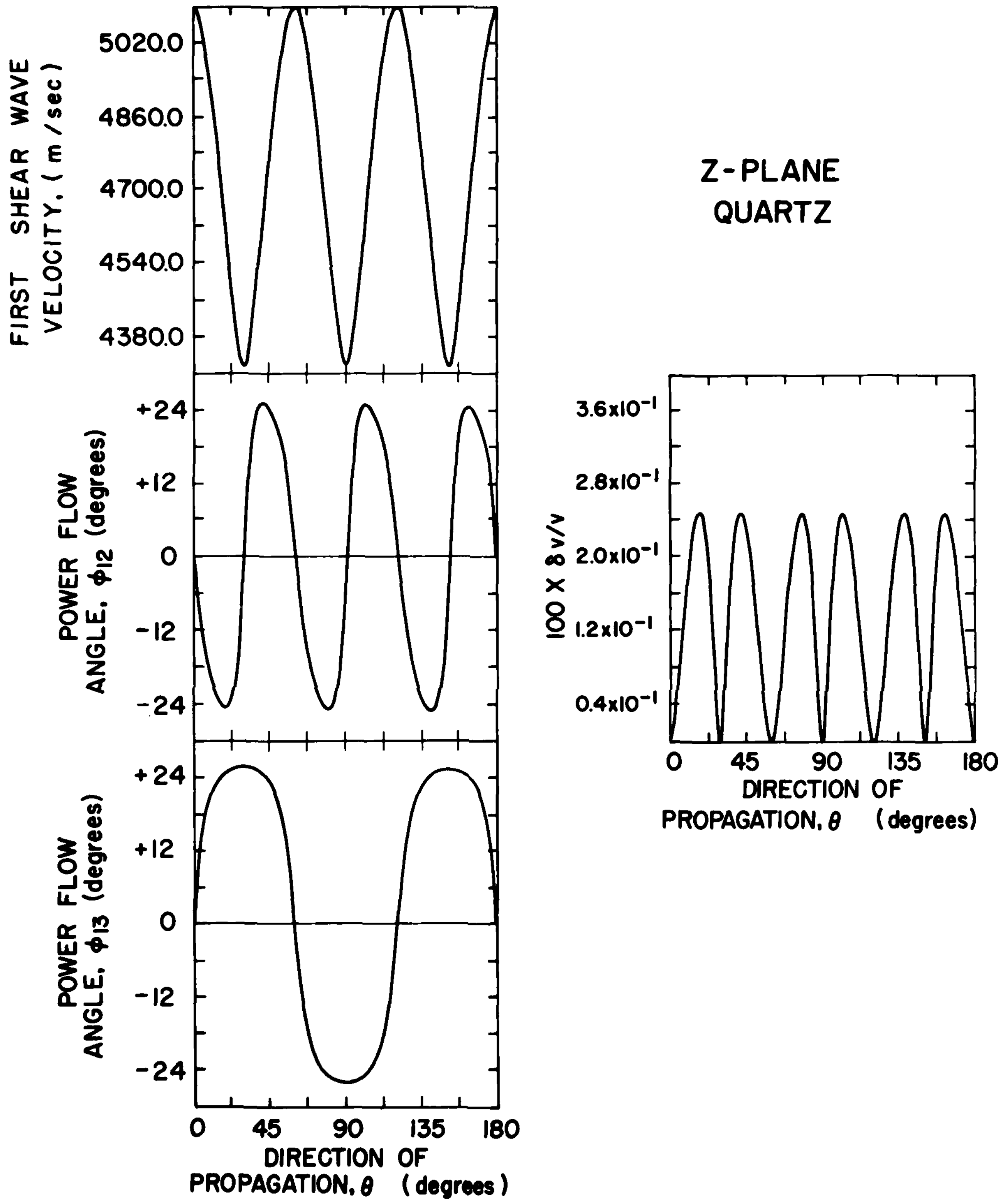
LONGITUDINAL WAVE VELOCITY, (m / sec)
6600.0
6400.0
6200.0
6000.0
5800.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Y-PLANE QUARTZ
100 X $\delta v/v$
4.5×10^{-1}
3.5×10^{-1}
2.5×10^{-1}
1.5×10^{-1}
0.5×10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



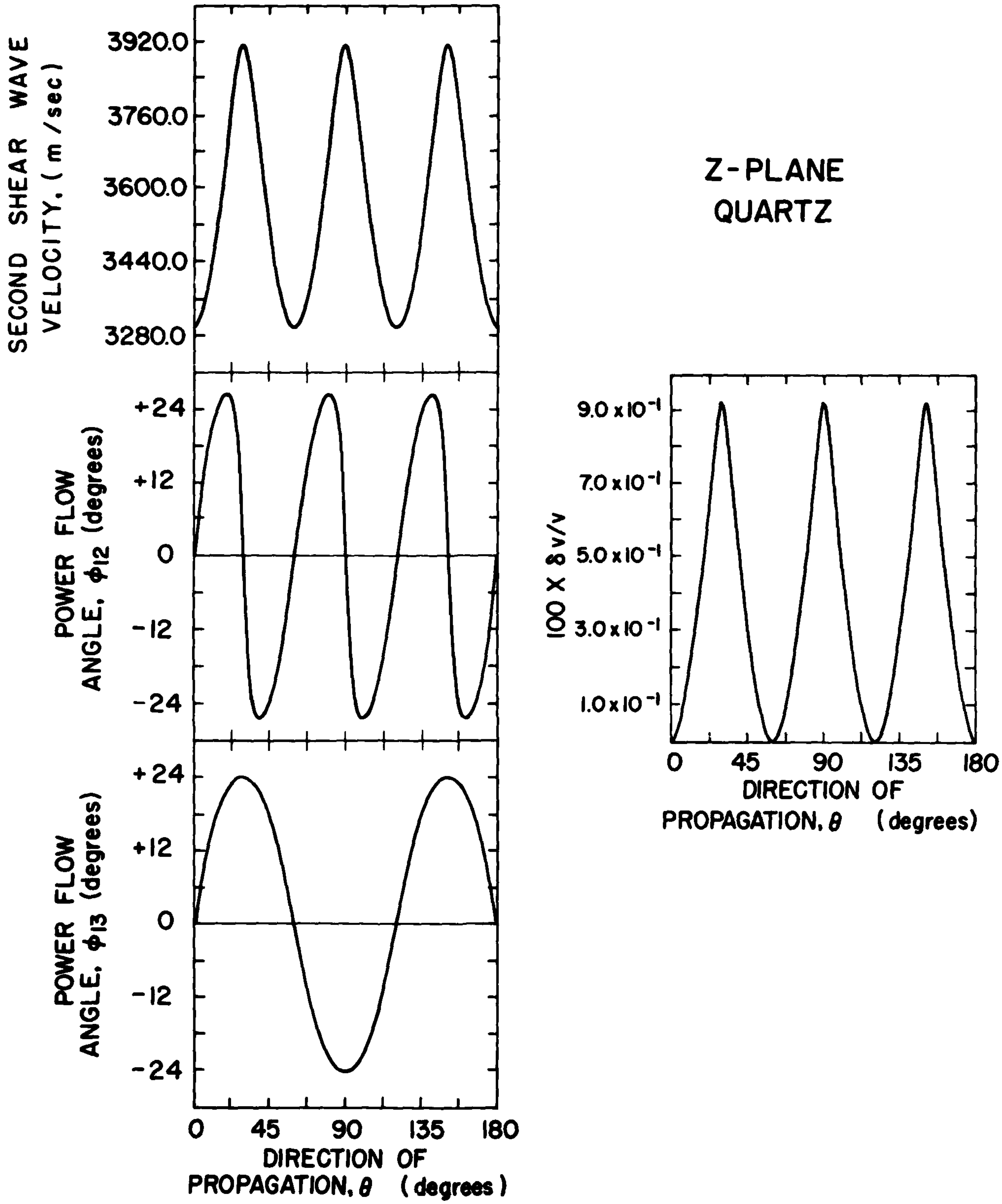
FIRST SHEAR WAVE VELOCITY, (m/sec)
6600.0
5800.0
5000.0
4200.0
3400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+24
+12
0
-12
-24
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Y-PLANE QUARTZ
$100 \times \delta v/v$
3.6×10^{-1}
2.8×10^{-1}
2.0×10^{-1}
1.2×10^{-1}
0.4×10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


SECOND SHEAR WAVE VELOCITY, (m /sec)
6600.0
5800.0
5000.0
4200.0
3400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+24
+12
0
-12
-24
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Y-PLANE QUARTZ
100 X $\delta v/v$
3.6x10^{-1}
2.8x10^{-1}
2.0x10^{-1}
1.2x10^{-1}
0.4x10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

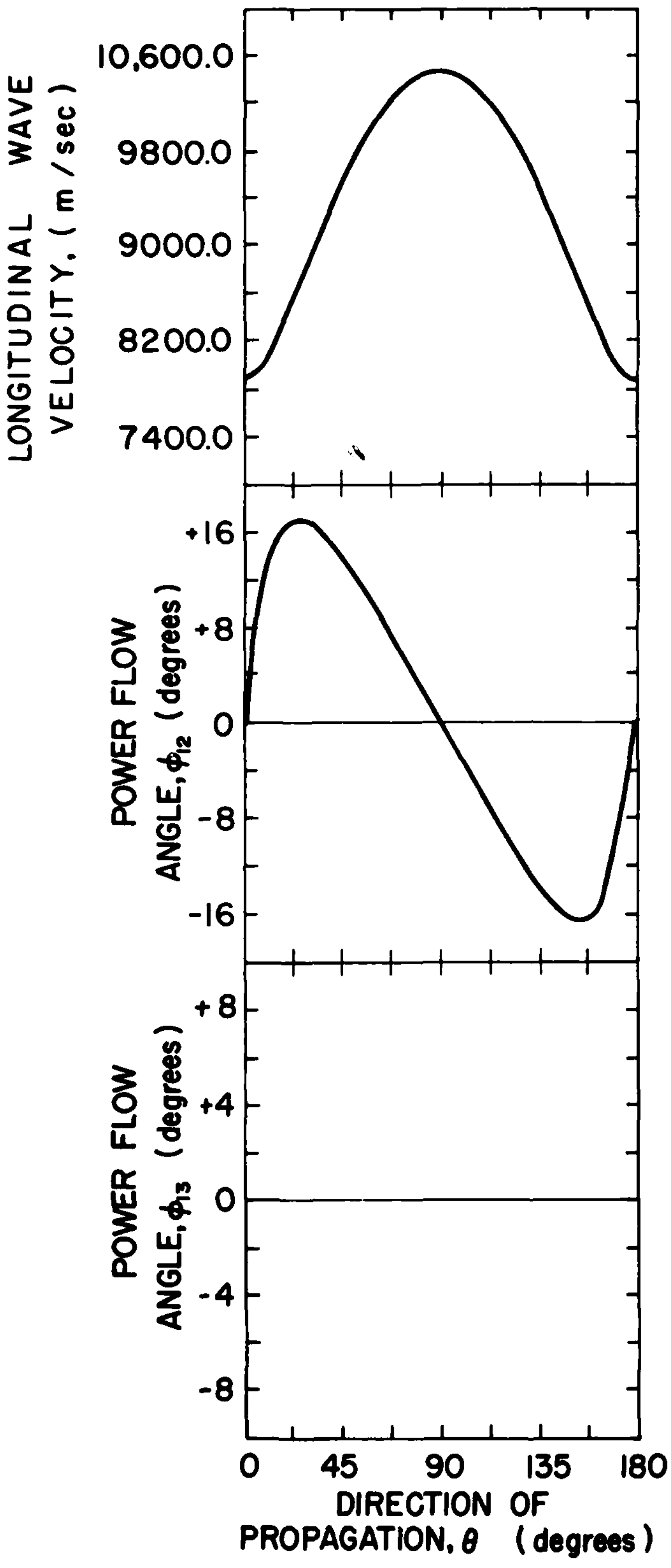

Z-PLANE
QUARTZ
LONGITUDINAL WAVE VELOCITY, (m/sec)
6060.0
5980.0
5900.0
5820.0
5740.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+24
+12
0
-12
-24
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
4.5×10^{-1}
3.5×10^{-1}
2.5×10^{-1}
1.5×10^{-1}
0.5×10^{-1}
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)



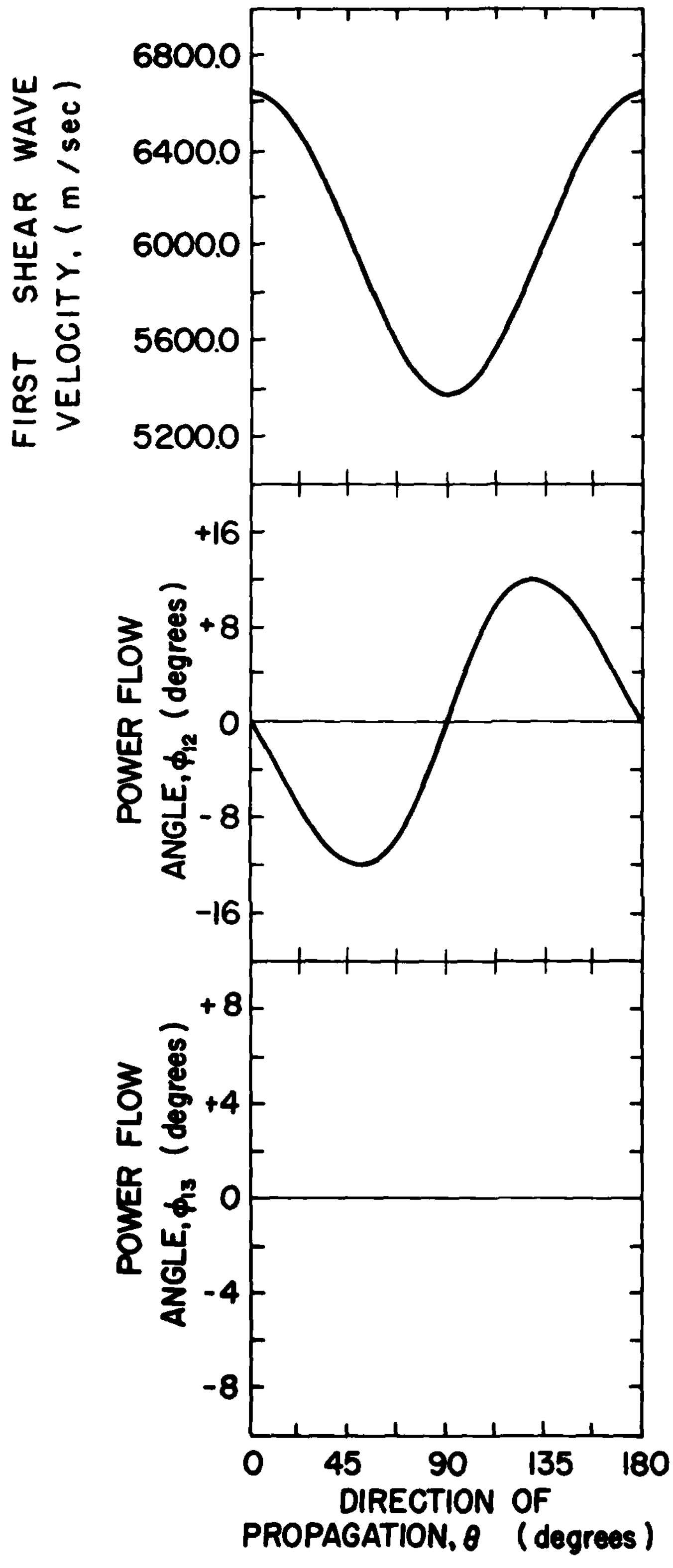
FIRST SHEAR WAVE
VELOCITY, (m/sec)
5020.0
4860.0
4700.0
4540.0
4380.0
POWER FLOW
ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW
ANGLE, ϕ_{13} (degrees)
+24
+12
0
-12
-24
0
45
90
135
180
DIRECTION OF
PROPAGATION, θ (degrees)
Z-PLANE
QUARTZ
100 X $\delta v/v$
3.6×10^{-1}
2.8×10^{-1}
2.0×10^{-1}
1.2×10^{-1}
0.4×10^{-1}
0
45
90
135
180
DIRECTION OF
PROPAGATION, θ (degrees)



SECOND SHEAR WAVE VELOCITY, (m/sec)
3920.0
3760.0
3600.0
3440.0
3280.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+24
+12
0
-12
-24
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE QUARTZ
100 X $\delta v/v$
9.0×10^{-1}
7.0×10^{-1}
5.0×10^{-1}
3.0×10^{-1}
1.0×10^{-1}
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

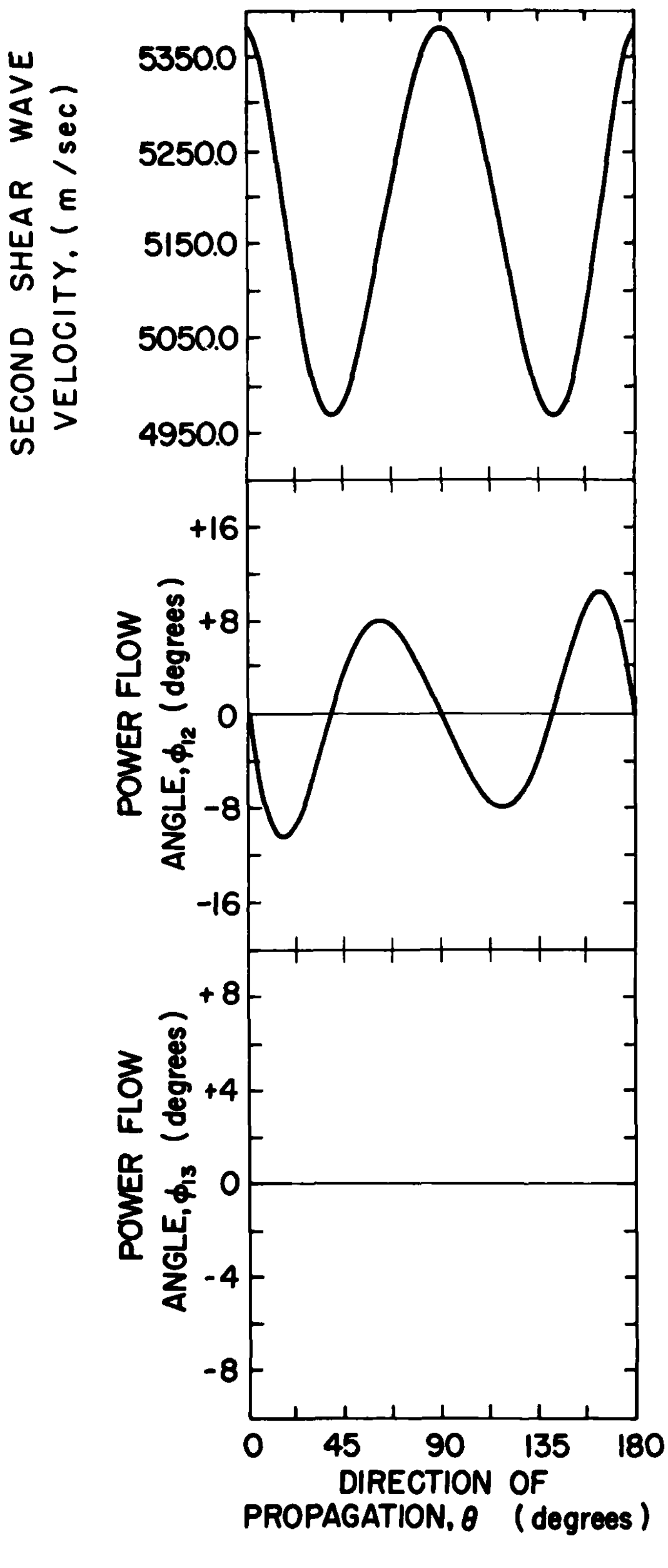


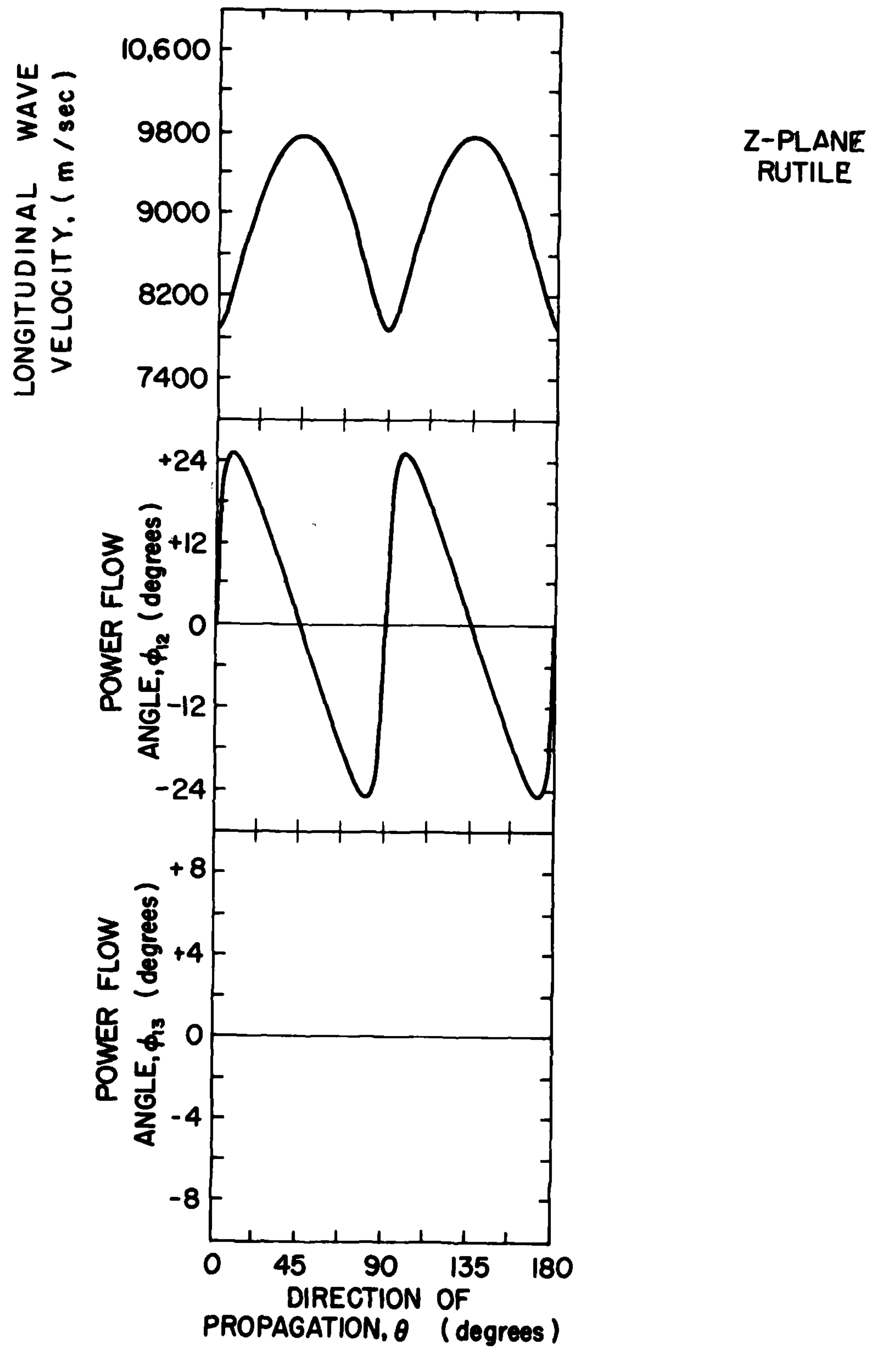
X-PLANE + Y-PLANE
RUTILE

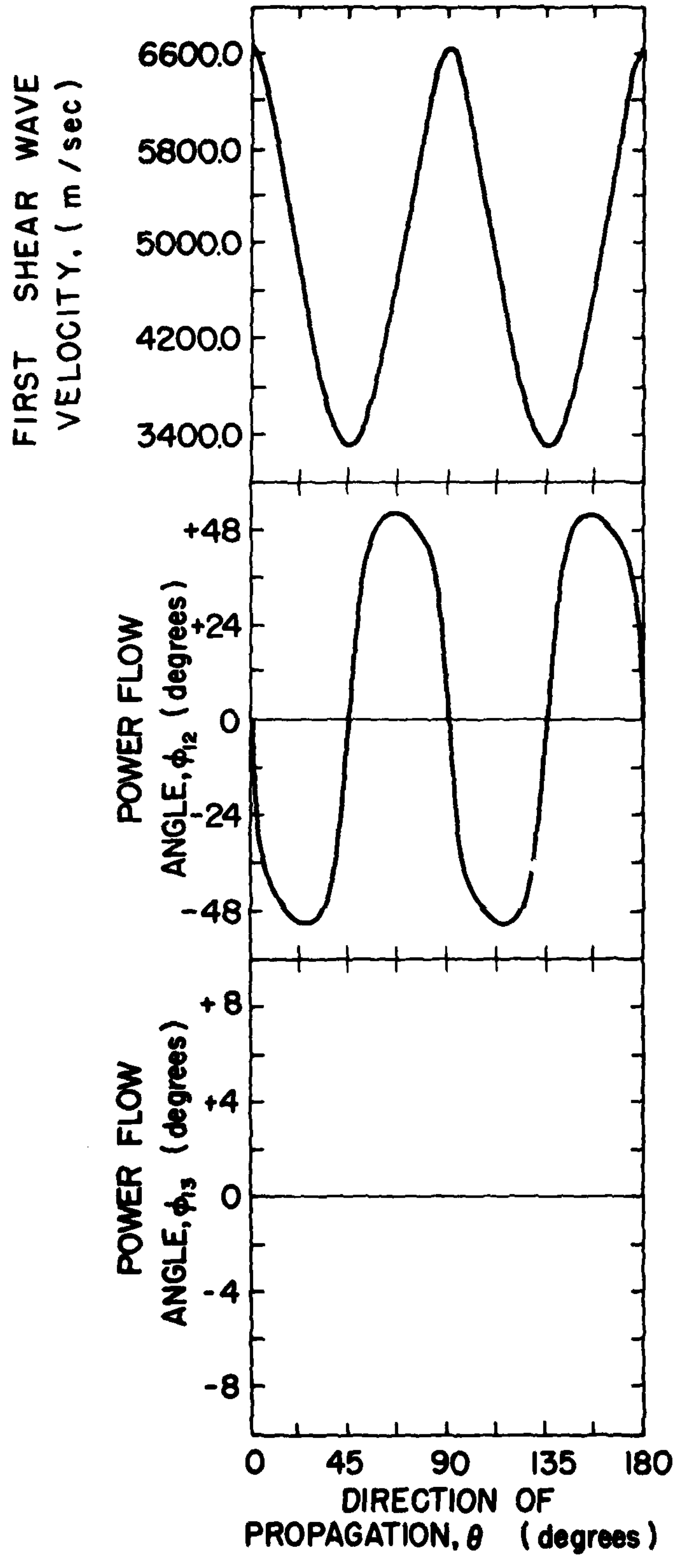


X-PLANE + Y-PLANE
RUTILE

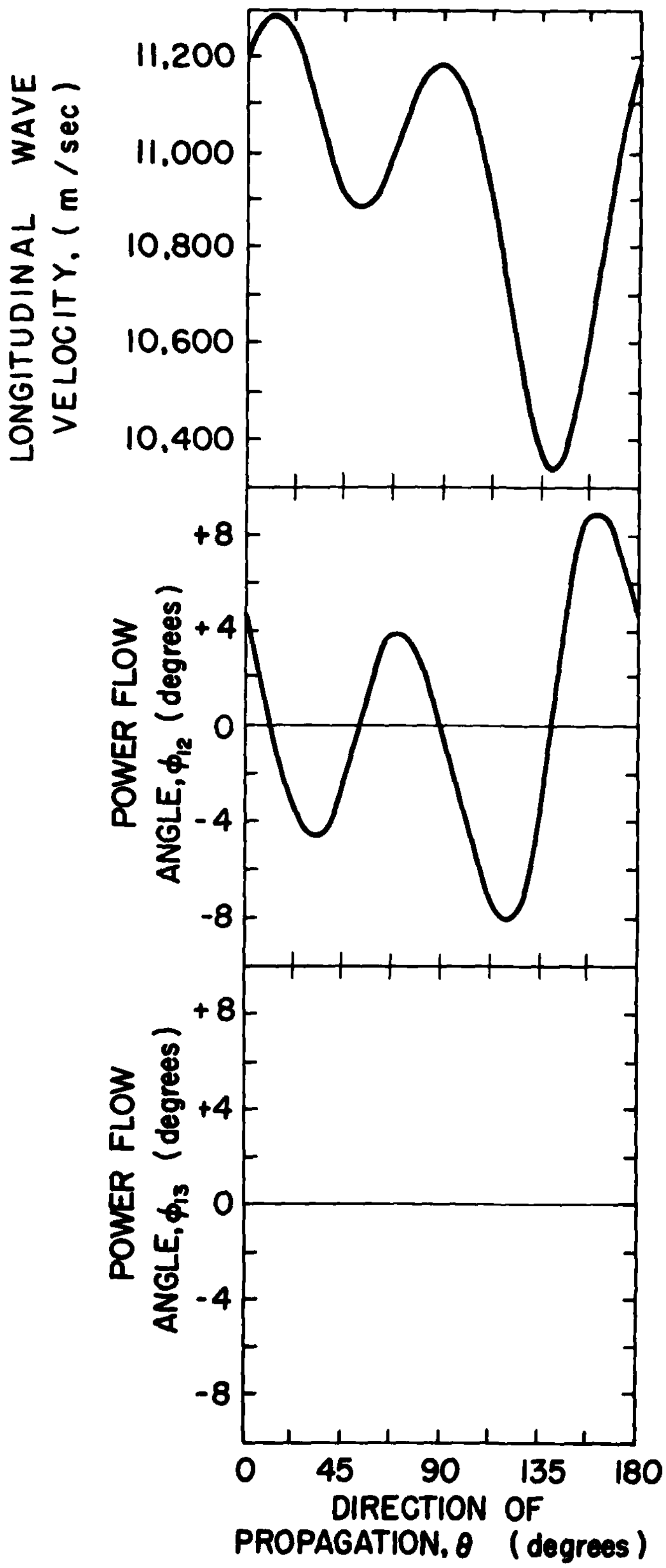
X-PLANE + Y-PLANE
RUTILE



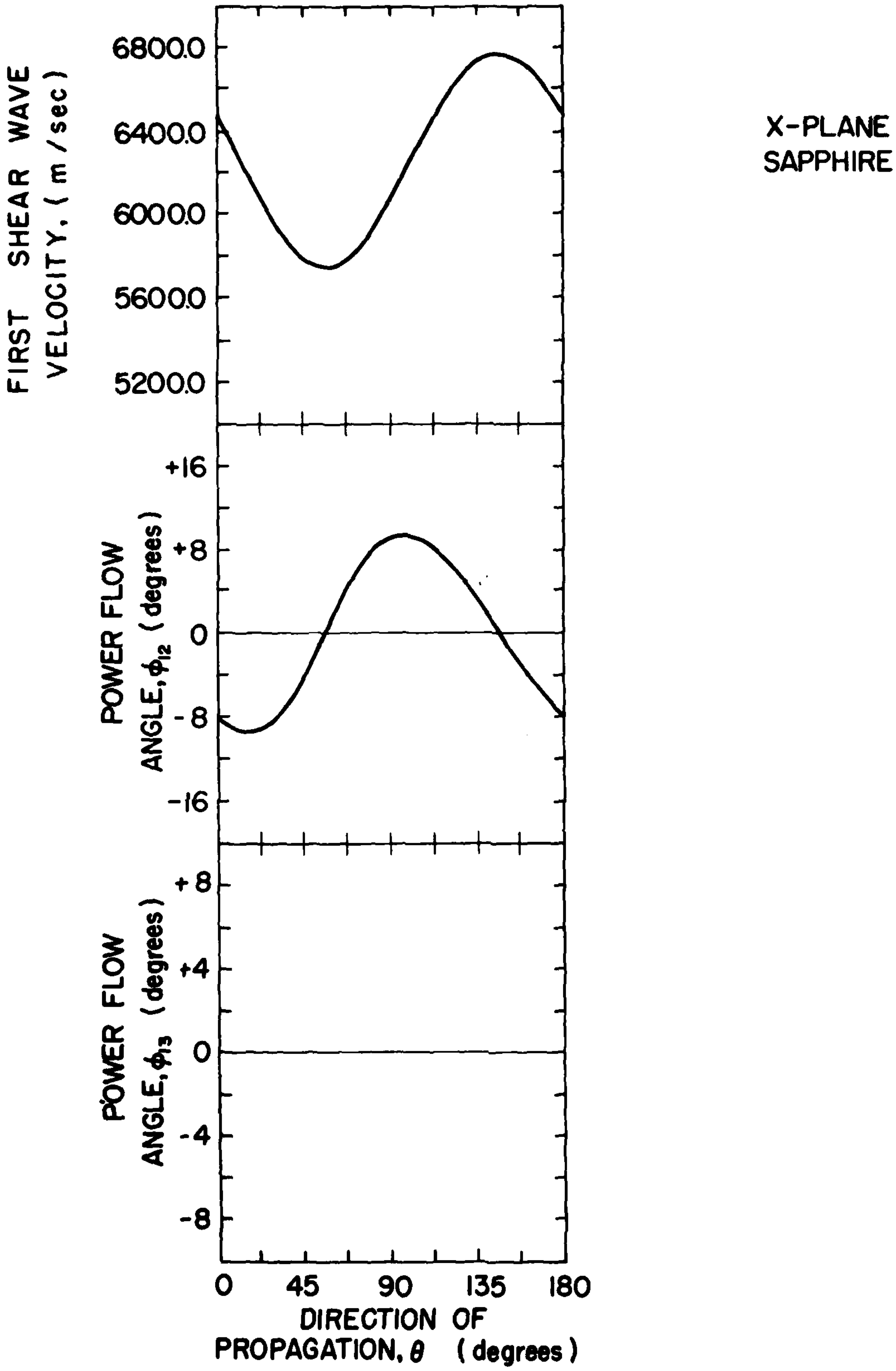

10,600
9800
9000
8200
7400
LONGITUDINAL WAVE VELOCITY, (m/sec)
Z-PLANE
RUTILE
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

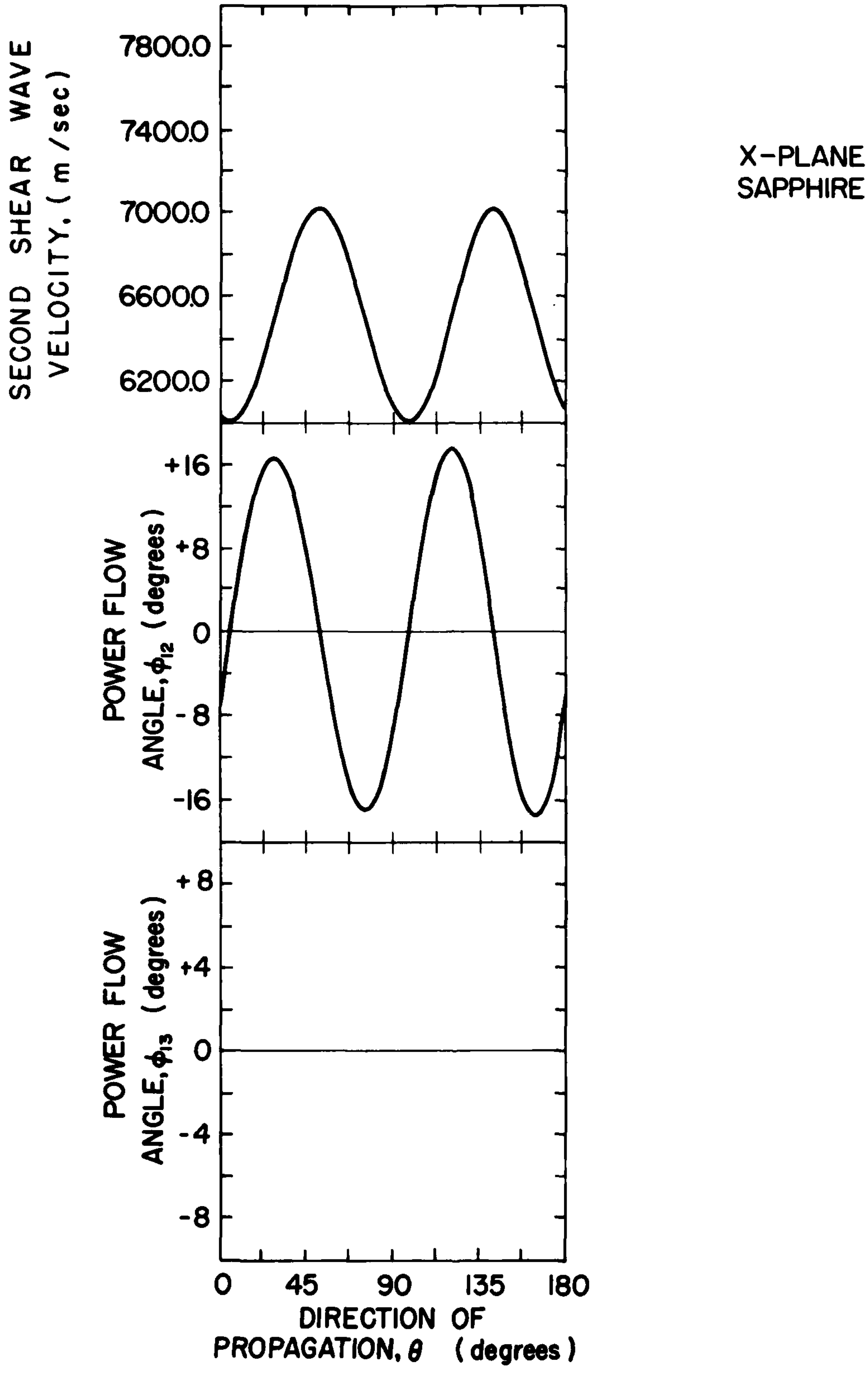


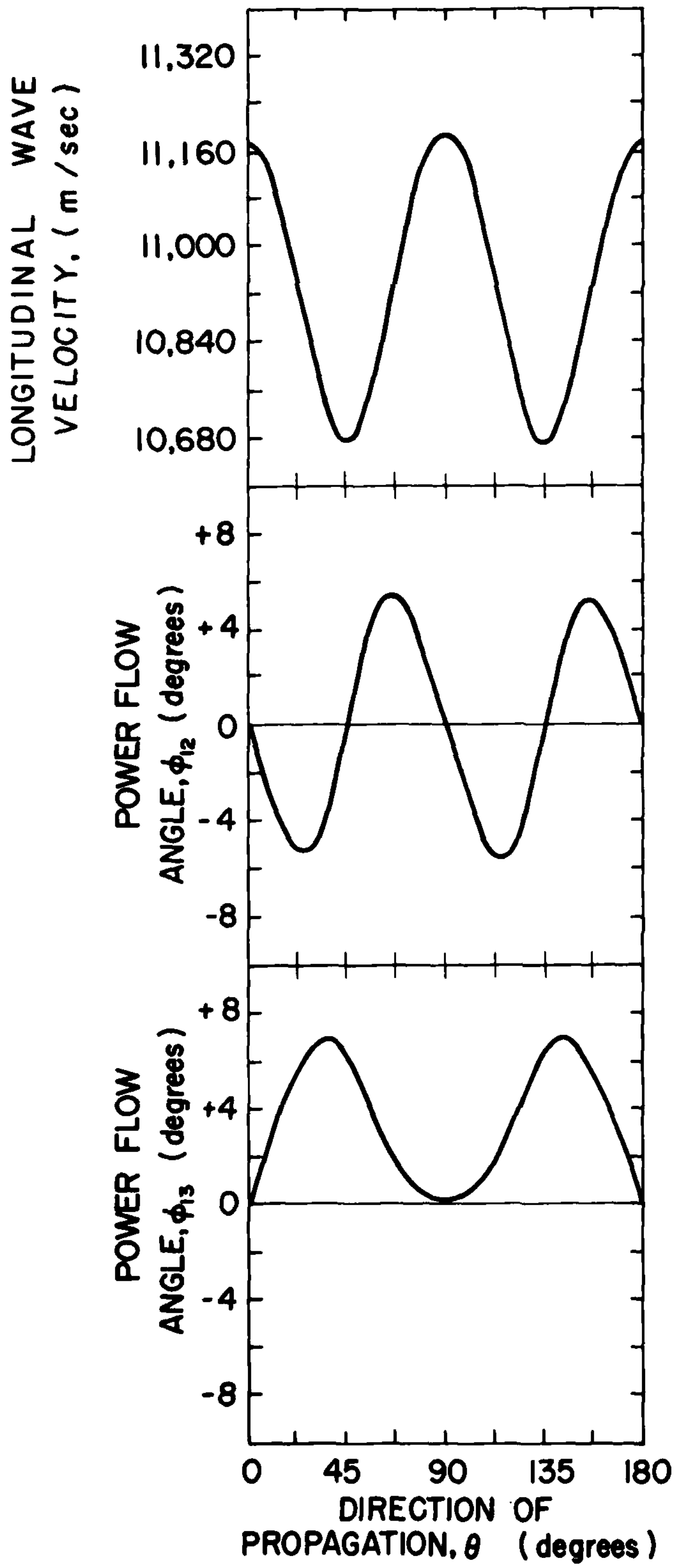
Z-PLANE
RUTILE



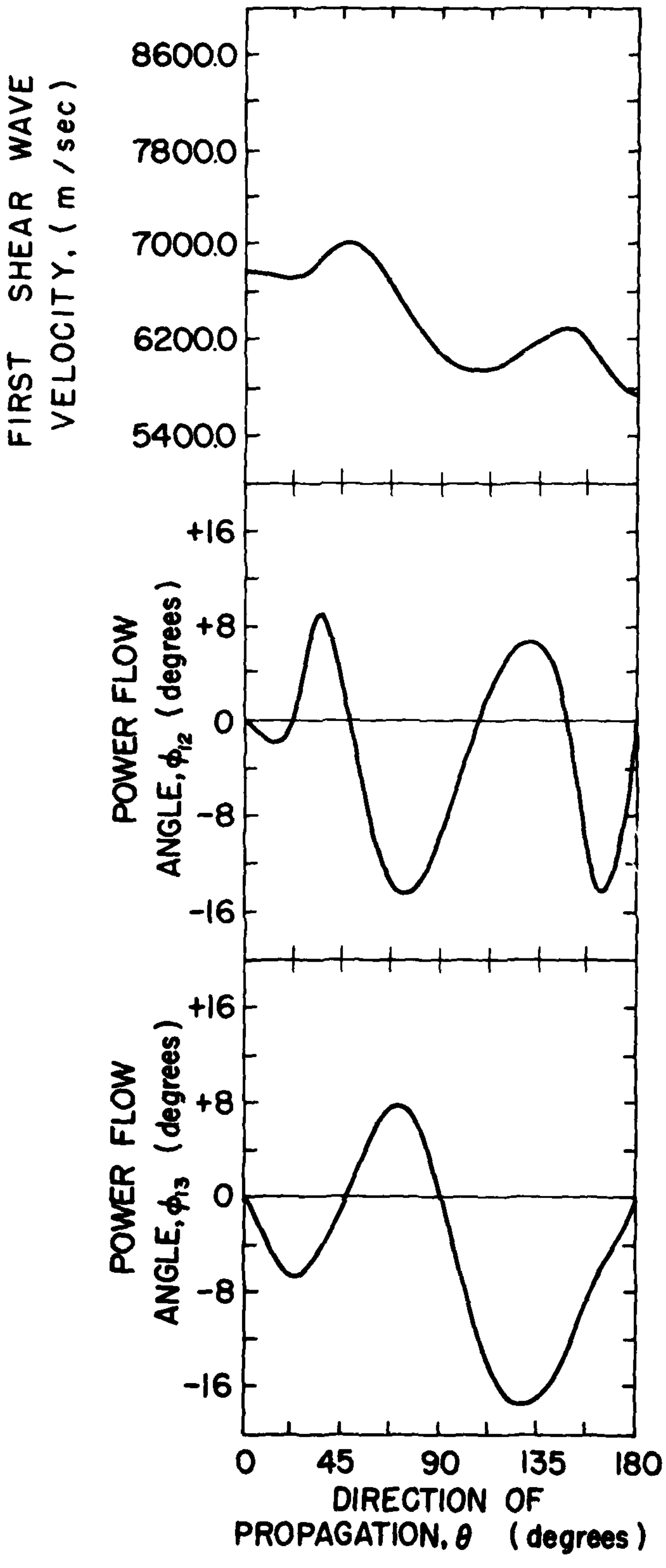
X-PLANE
SAPPHIRE


FIRST SHEAR WAVE VELOCITY, (m/sec)
6800.0
6400.0
6000.0
5600.0
5200.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
X-PLANE
SAPPHIRE

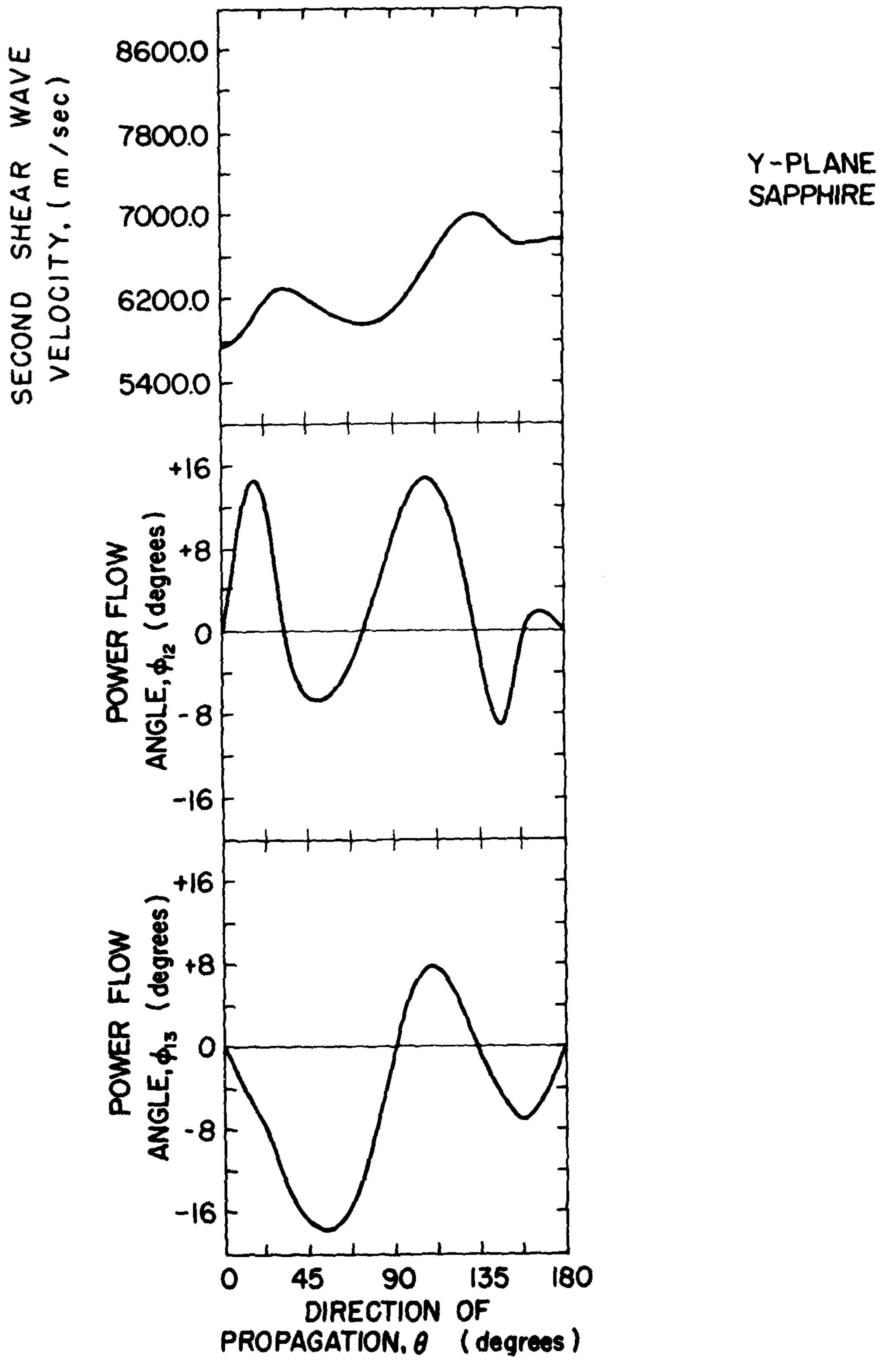

SECOND SHEAR WAVE VELOCITY, (m/sec)
7800.0
7400.0
7000.0
6600.0
6200.0
X-PLANE SAPPHIRE
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



Y-PLANE SAPPHIRE



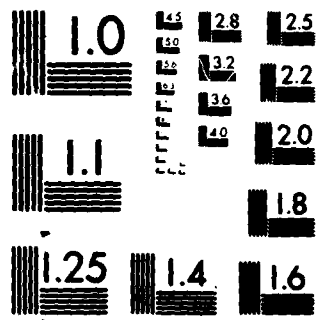
Y-PLANE
SAPPHIRE



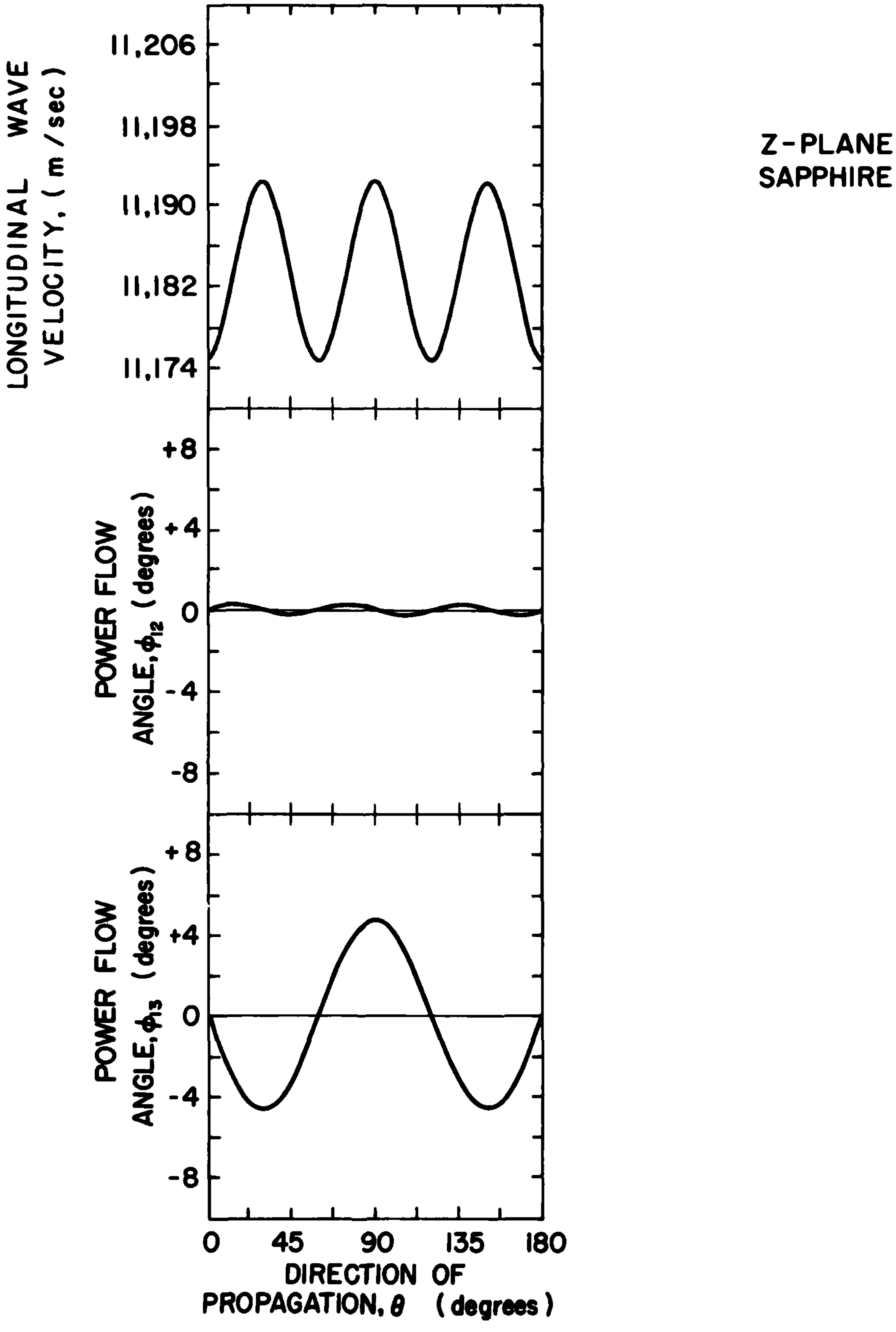
SECOND SHEAR WAVE VELOCITY, (m/sec)
8600.0
7800.0
7000.0
6200.0
5400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Y-PLANE
SAPPHIRE

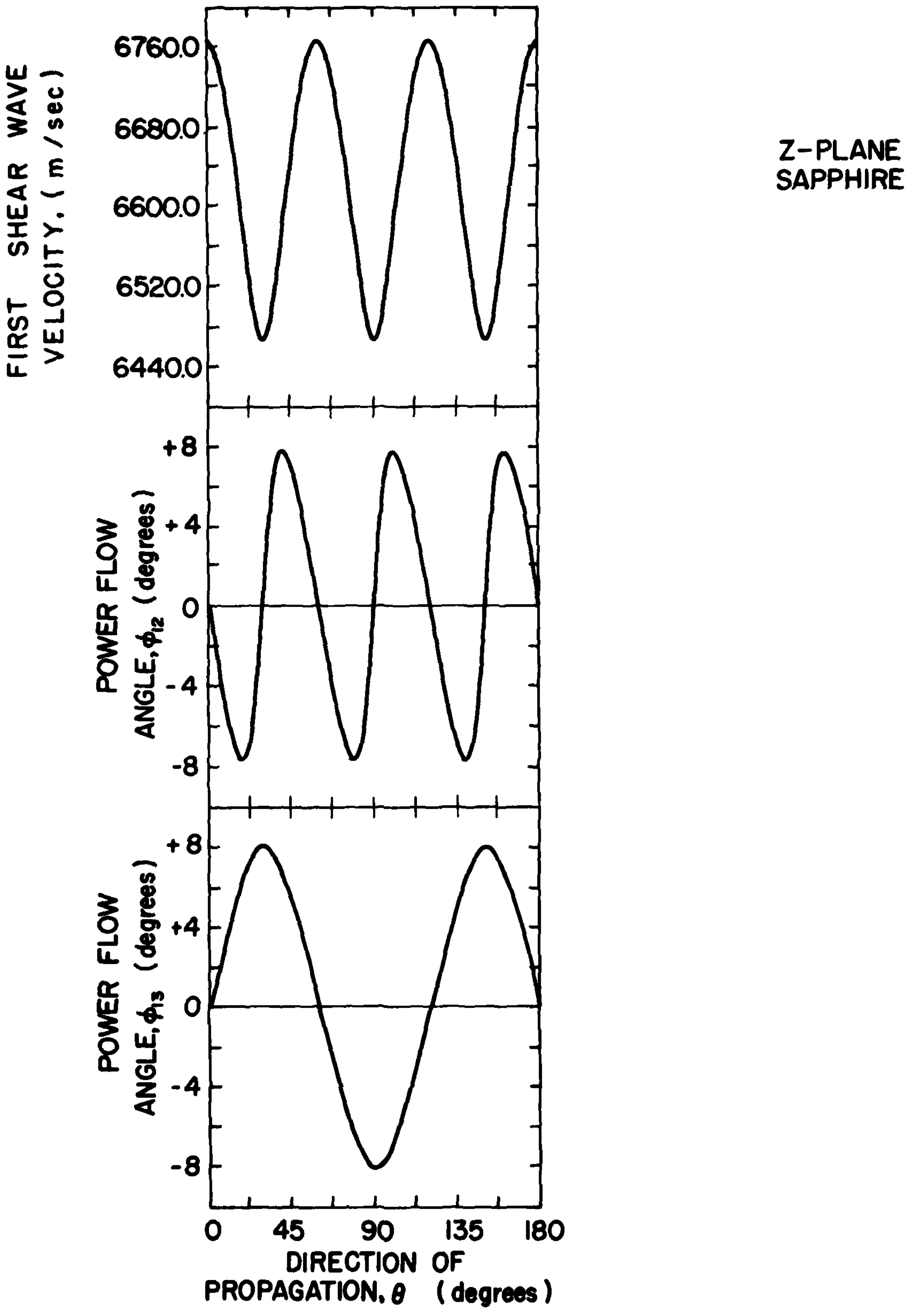
AD-A090 947 ROME AIR DEVELOPMENT CENTER GRIFFISS AFB NY F/G 20/1
MICROWAVE ACOUSTICS HANDBOOK. VOLUME 3. BULK WAVE VELOCITIES.(U)
MAY 80 A J SLOBODNIK, R T DELMONICO
UNCLASSIFIED RADC-TR-80-188-VOL-3 NL

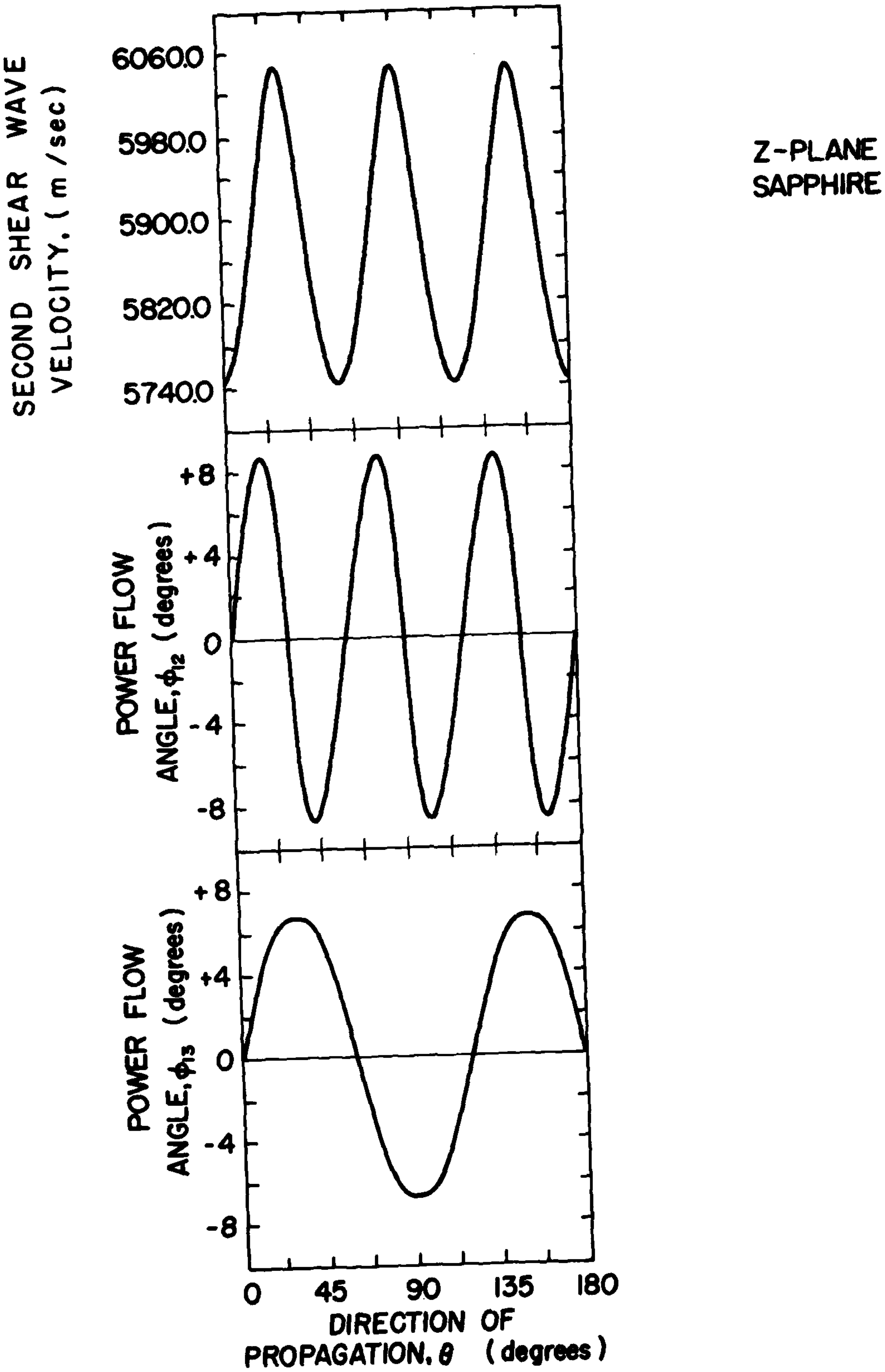
1 OF 6

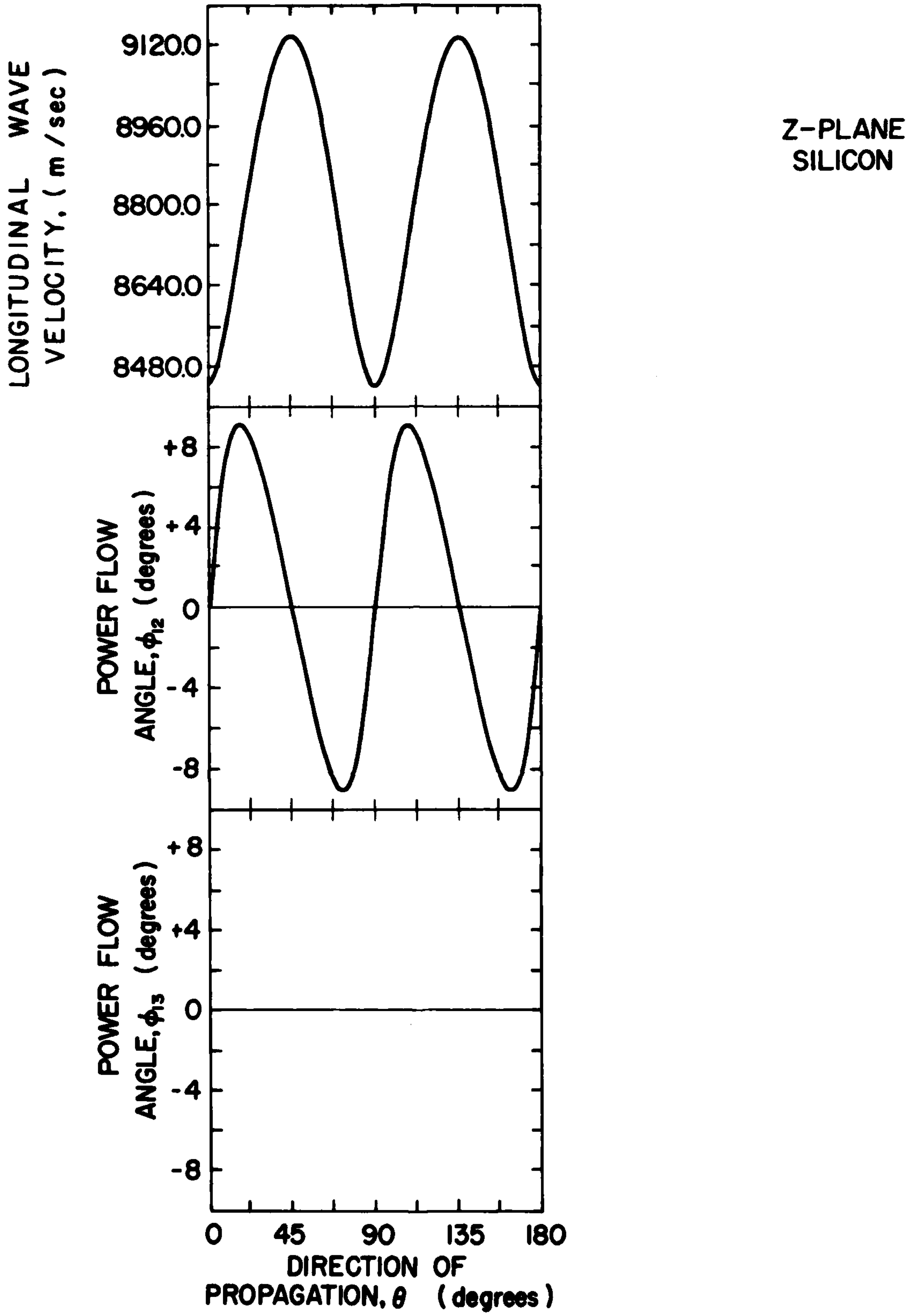


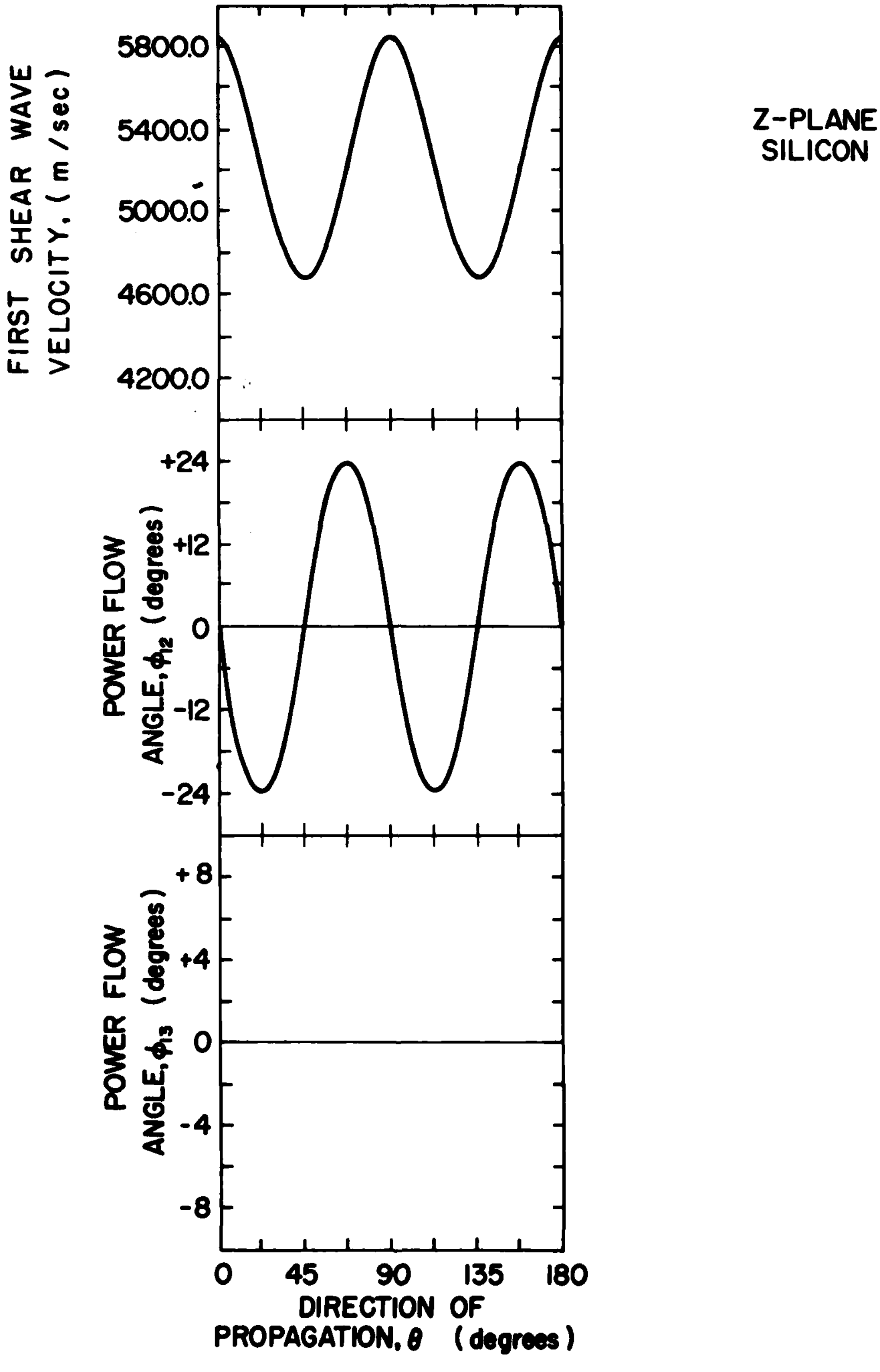
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A


LONGITUDINAL WAVE VELOCITY, (m/sec)
11,206
11,198
11,190
11,182
11,174
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
SAPPHIRE

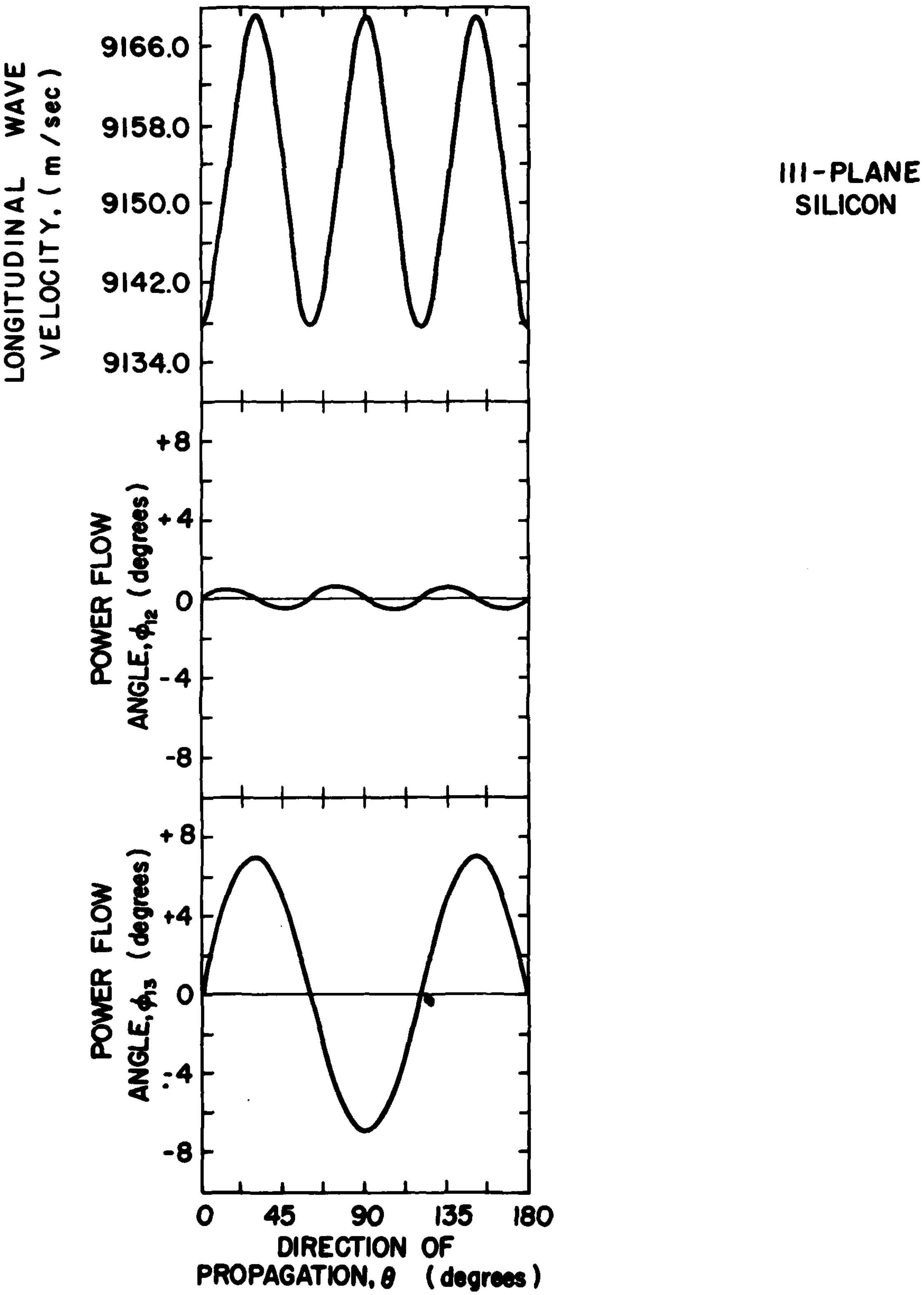

FIRST SHEAR WAVE VELOCITY, (m/sec)
6760.0
6680.0
6600.0
6520.0
6440.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
SAPPHIRE

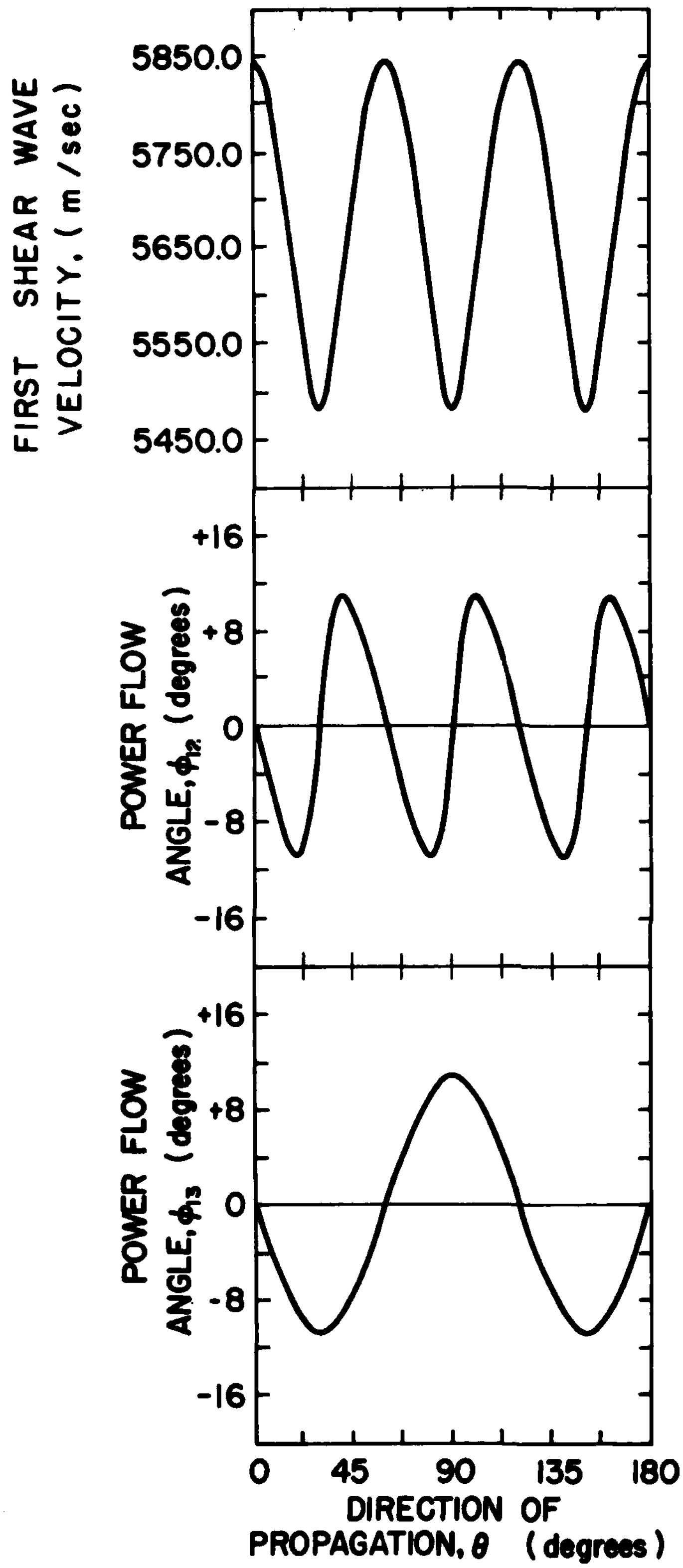

SECOND SHEAR WAVE VELOCITY, (m/sec)
6060.0
5980.0
5900.0
5820.0
5740.0
Z-PLANE
SAPPHIRE
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)


LONGITUDINAL WAVE VELOCITY, (m/sec)
9120.0
8960.0
8800.0
8640.0
8480.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
SILICON

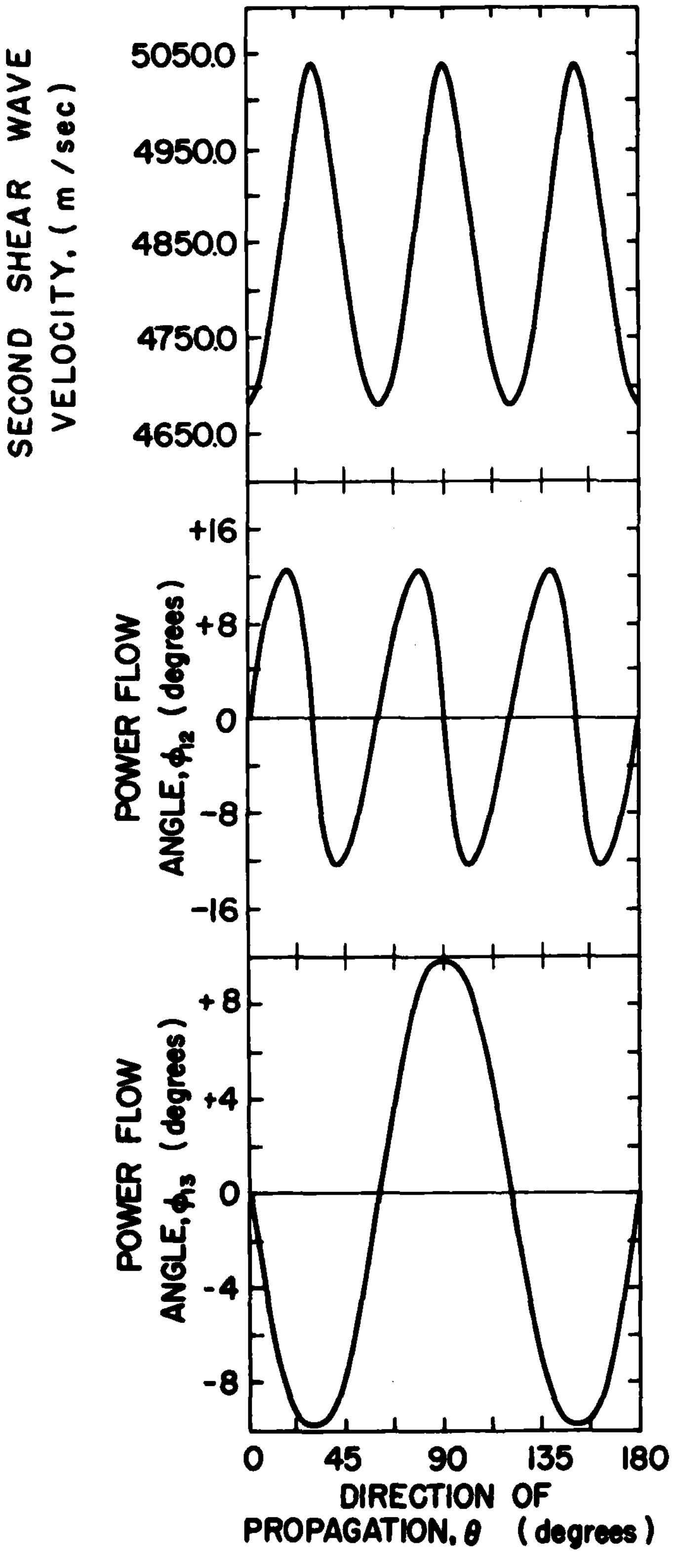


5800.0
5400.0
5000.0
4600.0
4200.0
FIRST SHEAR WAVE VELOCITY, (m/sec)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
SILICON

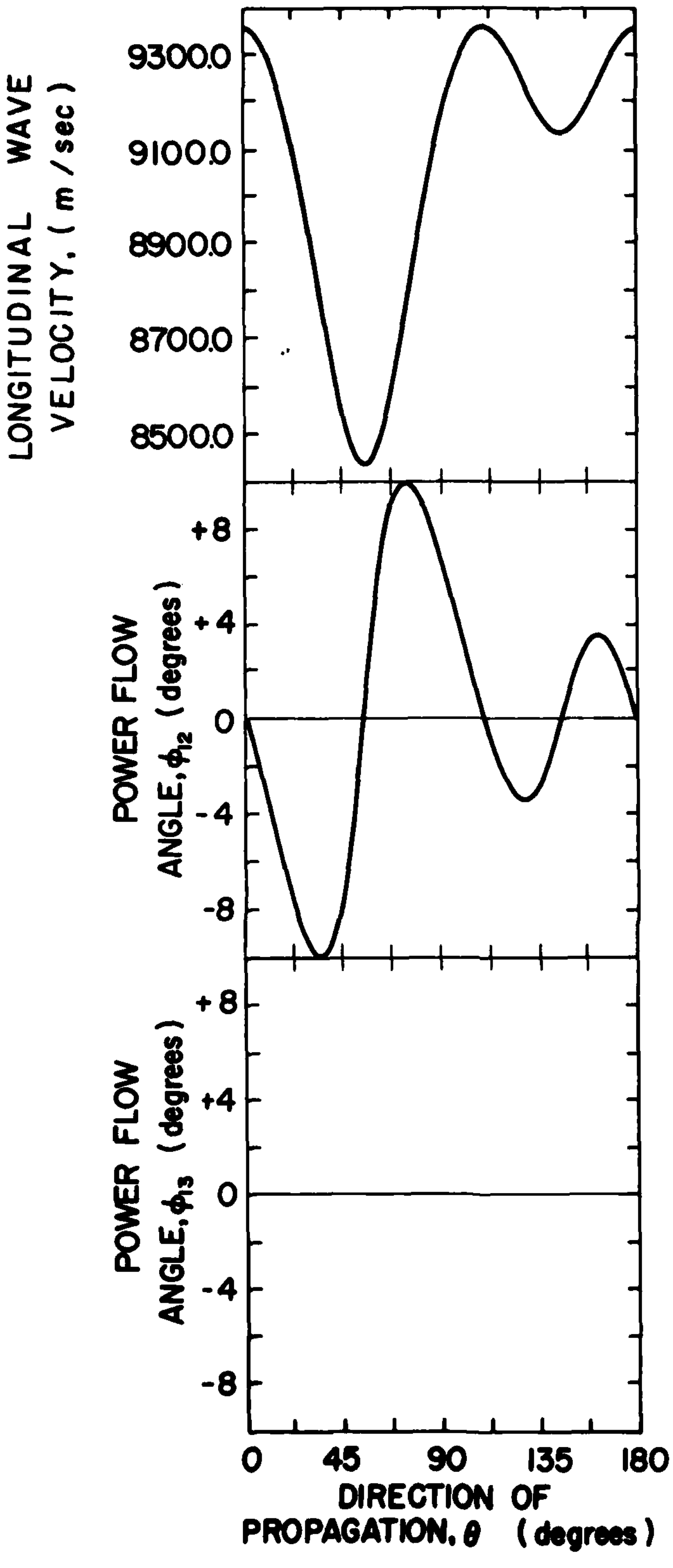

LONGITUDINAL WAVE VELOCITY, (m / sec)
9166.0
9158.0
9150.0
9142.0
9134.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
SILICON



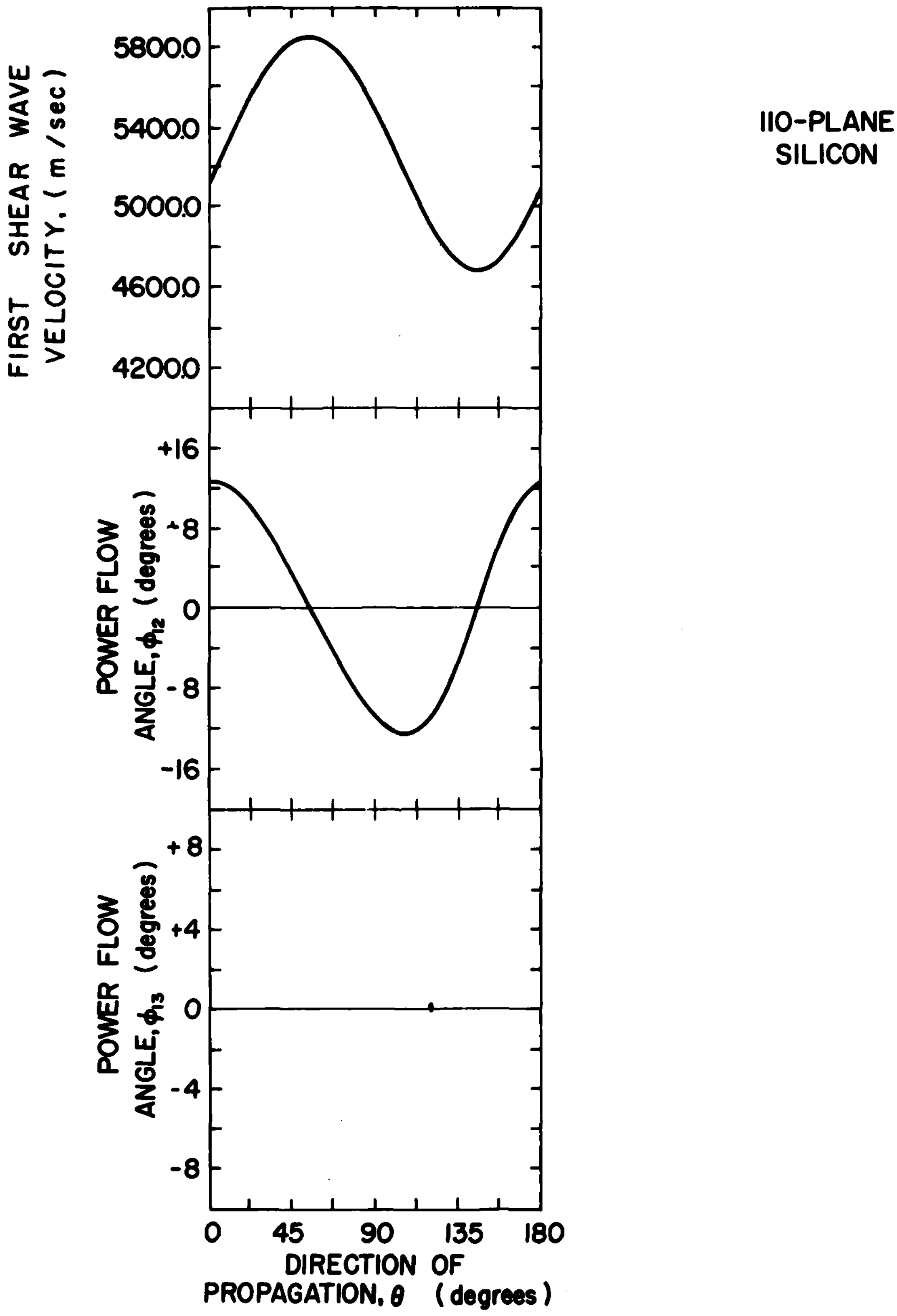
III-PLANE
SILICON



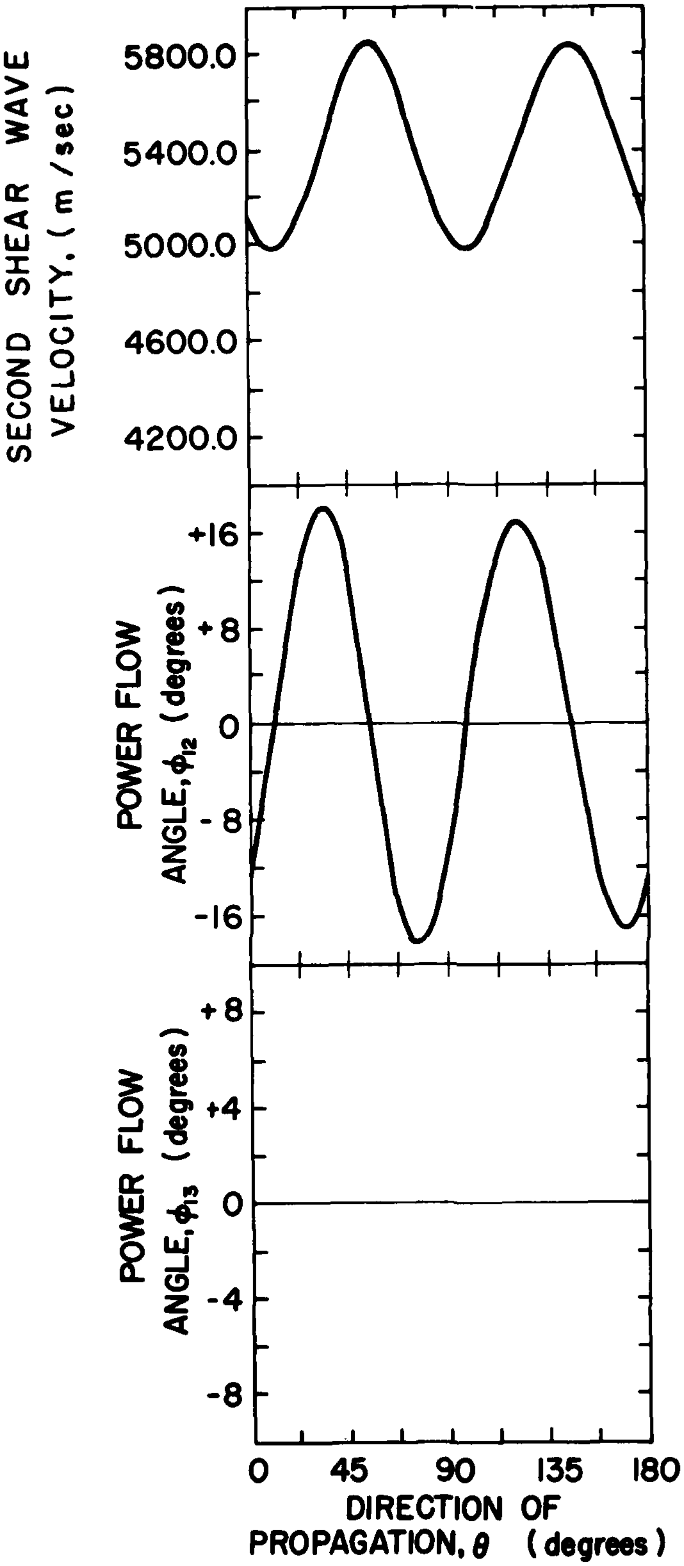
111-PLANE SILICON



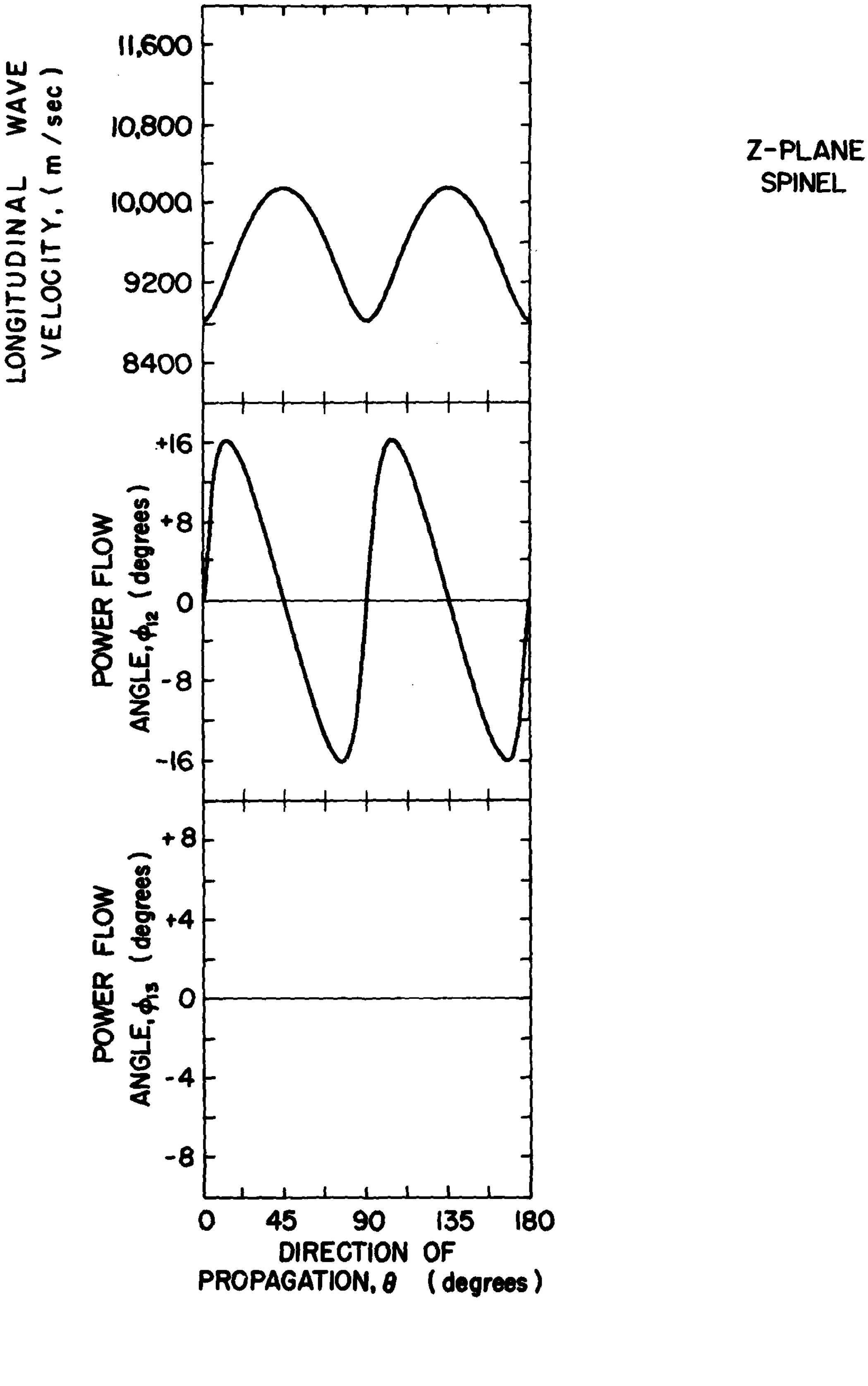
110-PLANE
SILICON

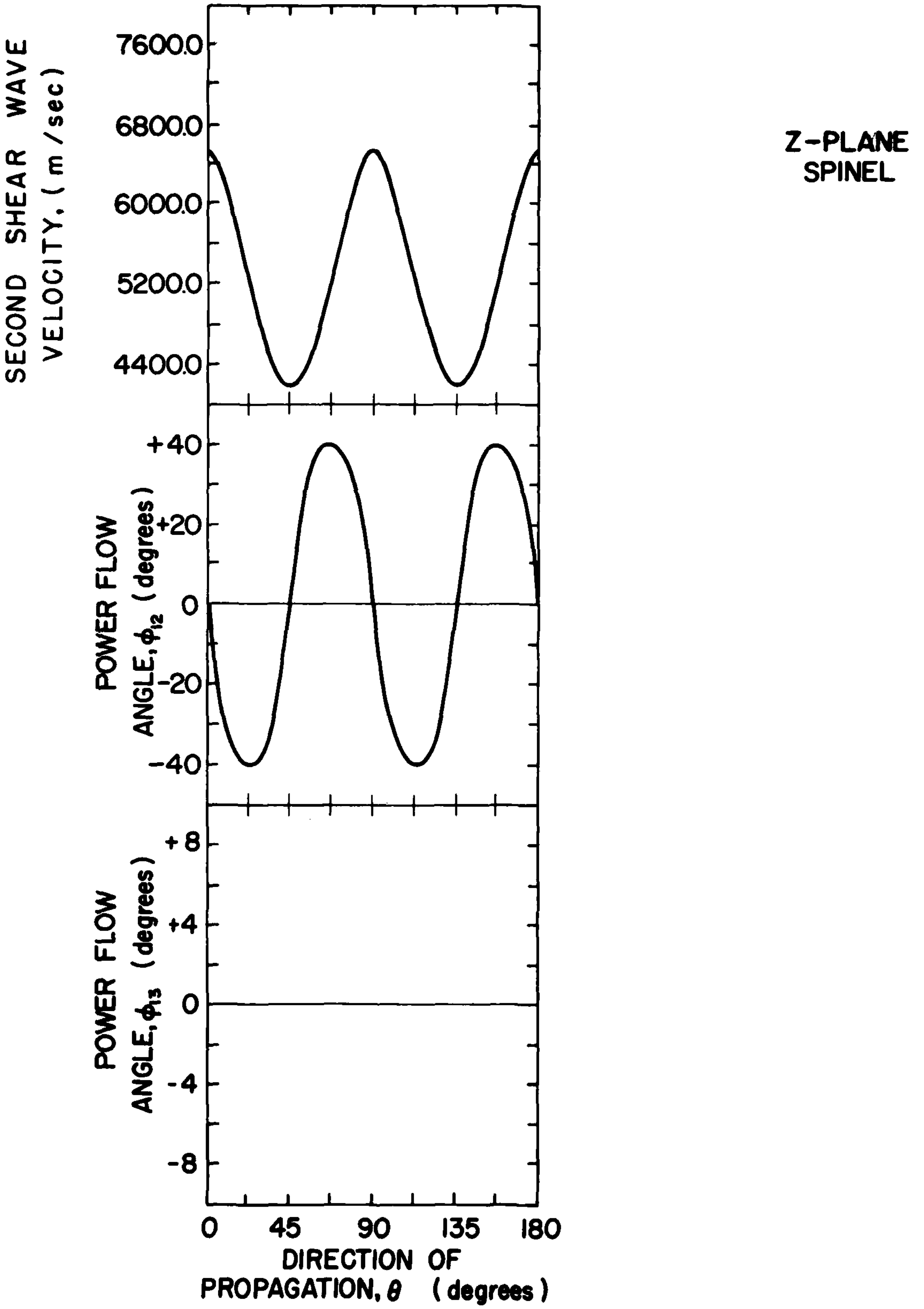


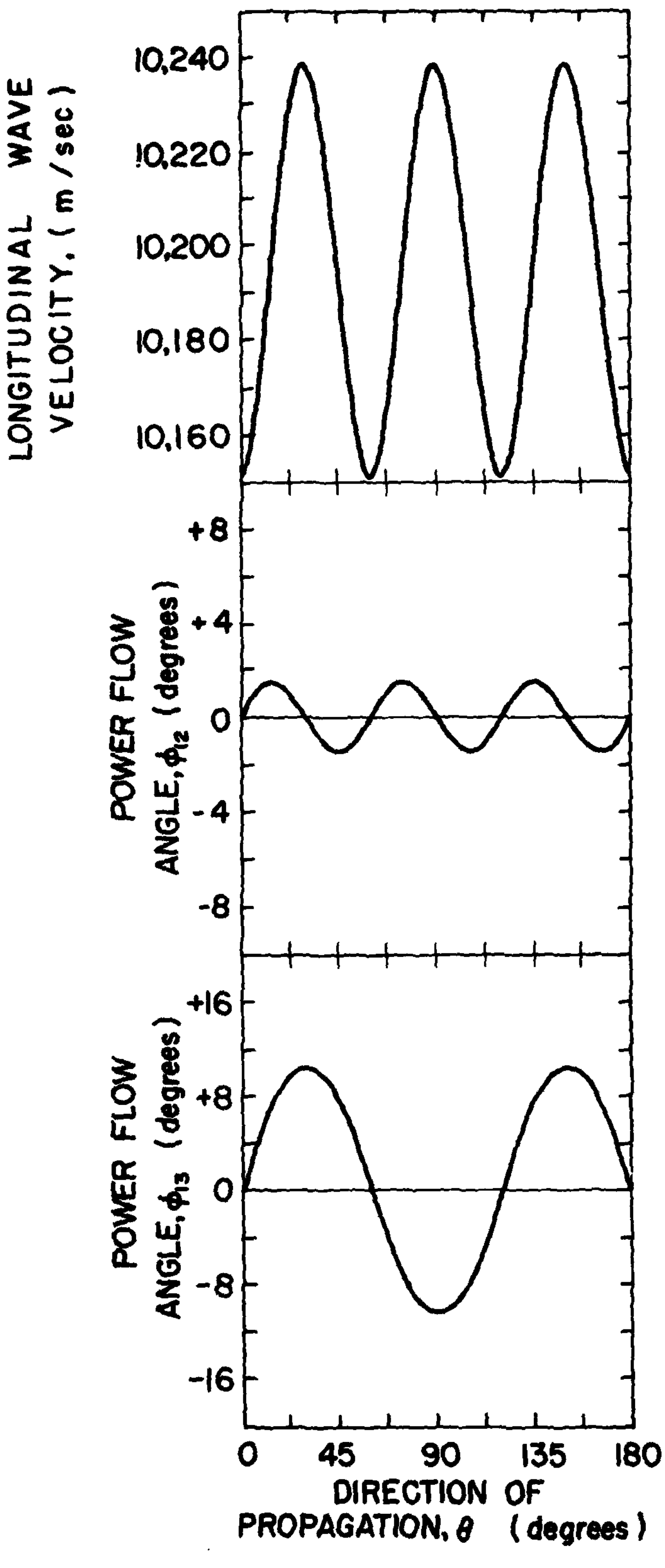
110-PLANE
SILICON
FIRST SHEAR WAVE
VELOCITY, (m/sec)
58000
54000
50000
46000
42000
POWER FLOW
ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW
ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF
PROPAGATION, θ (degrees)



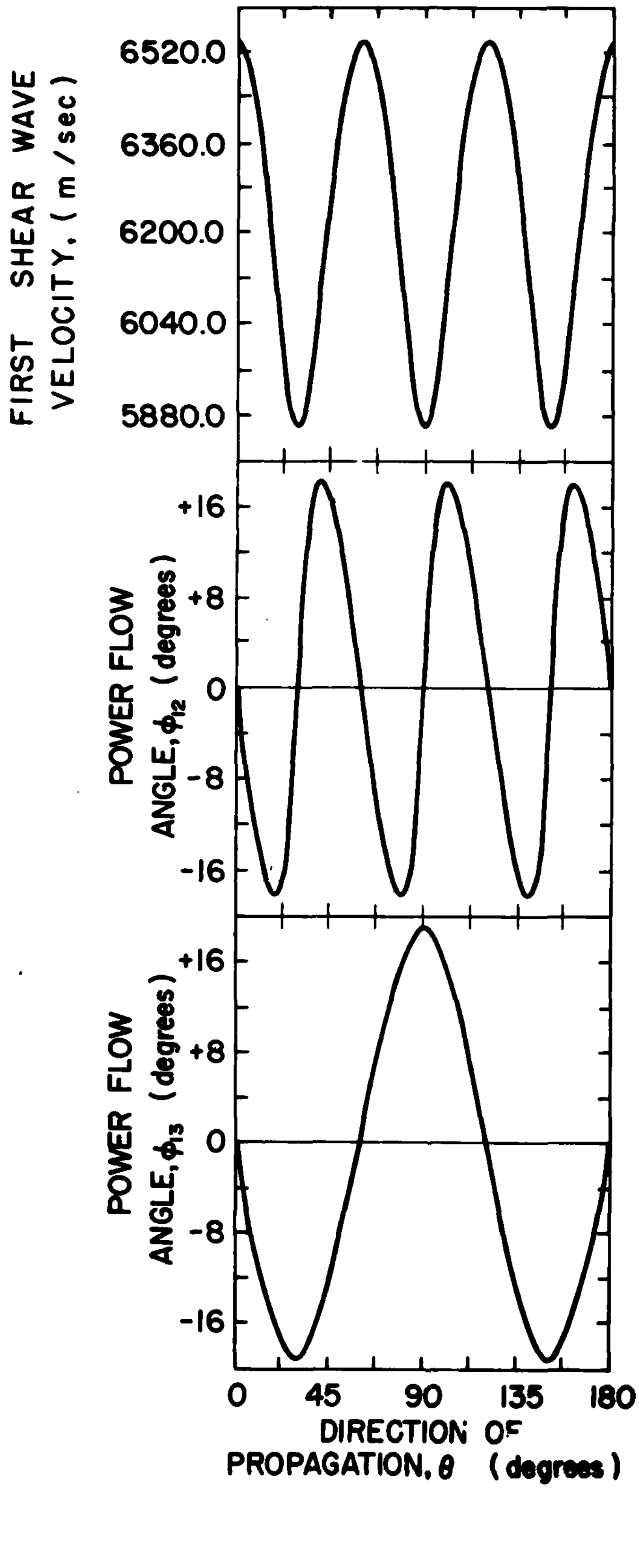
110-PLANE
SILICON


LONGITUDINAL WAVE VELOCITY, (m / sec)
11,600
10,800
10,000
9200
8400
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
SPINEL

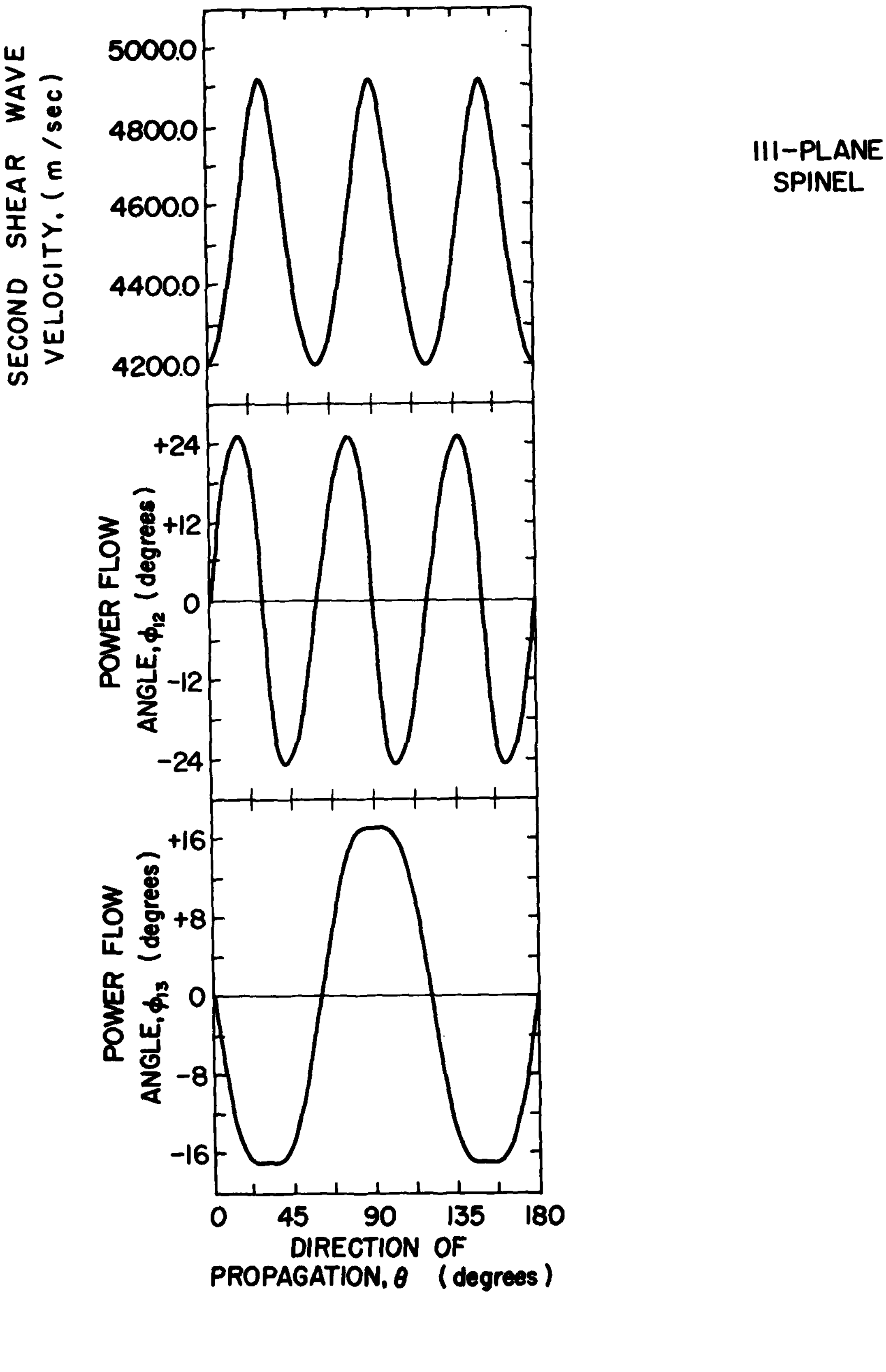

SECOND SHEAR WAVE VELOCITY, (m/sec)
7600.0
6800.0
6000.0
5200.0
4400.0
Z-PLANE SPINEL
POWER FLOW ANGLE, ϕ_{12} (degrees)
+40
+20
0
-20
-40
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)



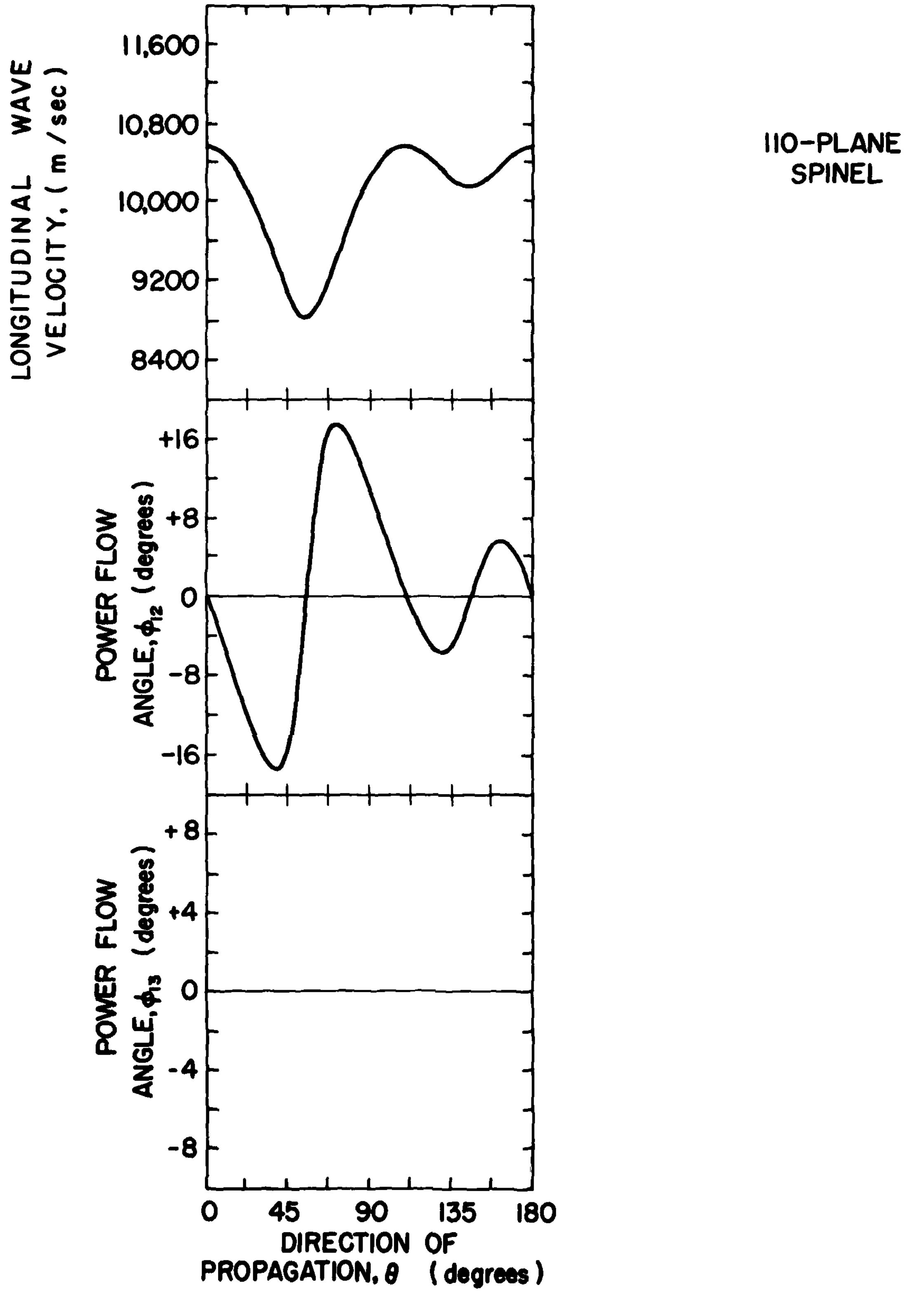
111-PLANE
SPINEL



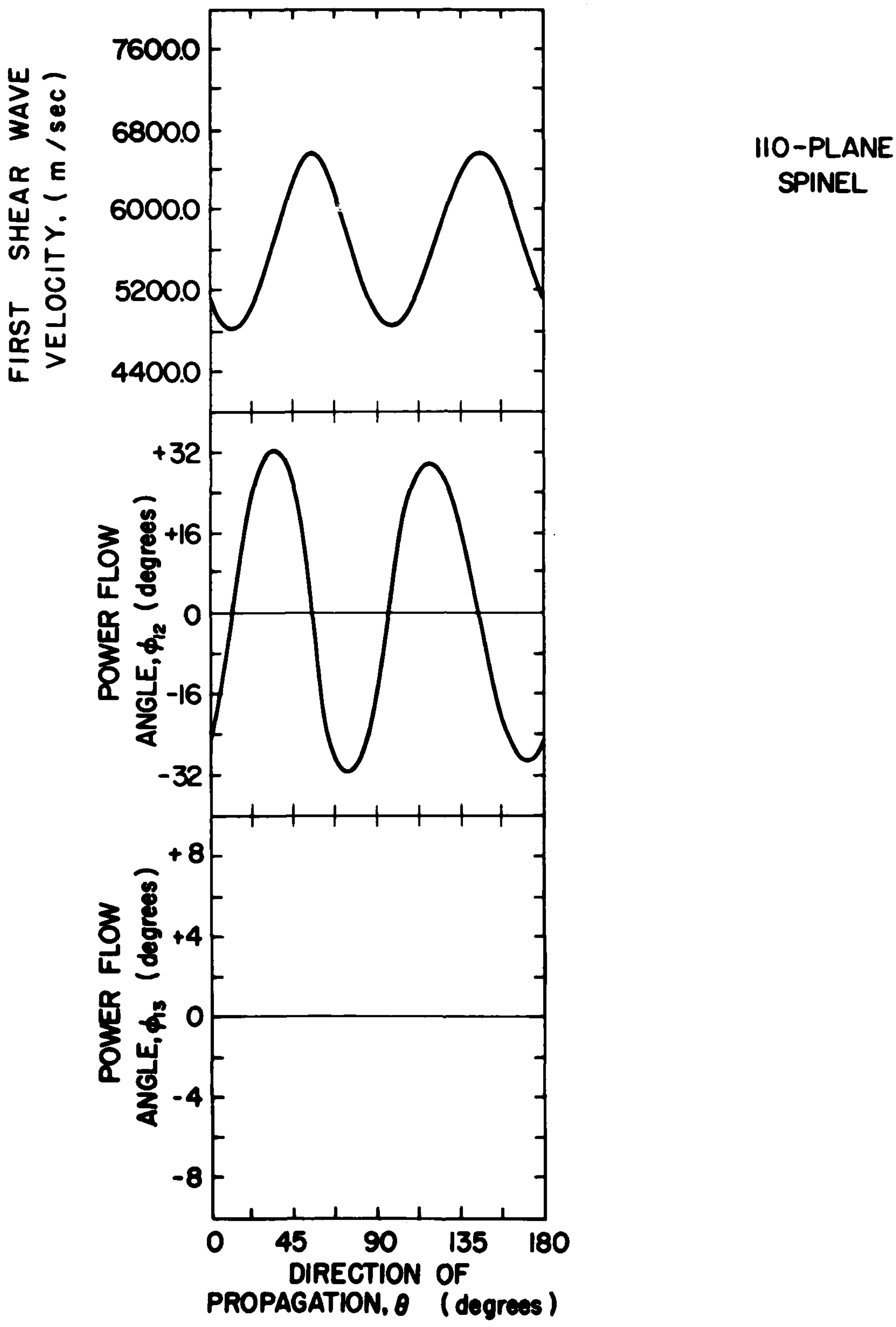
111-PLANE
SPINEL

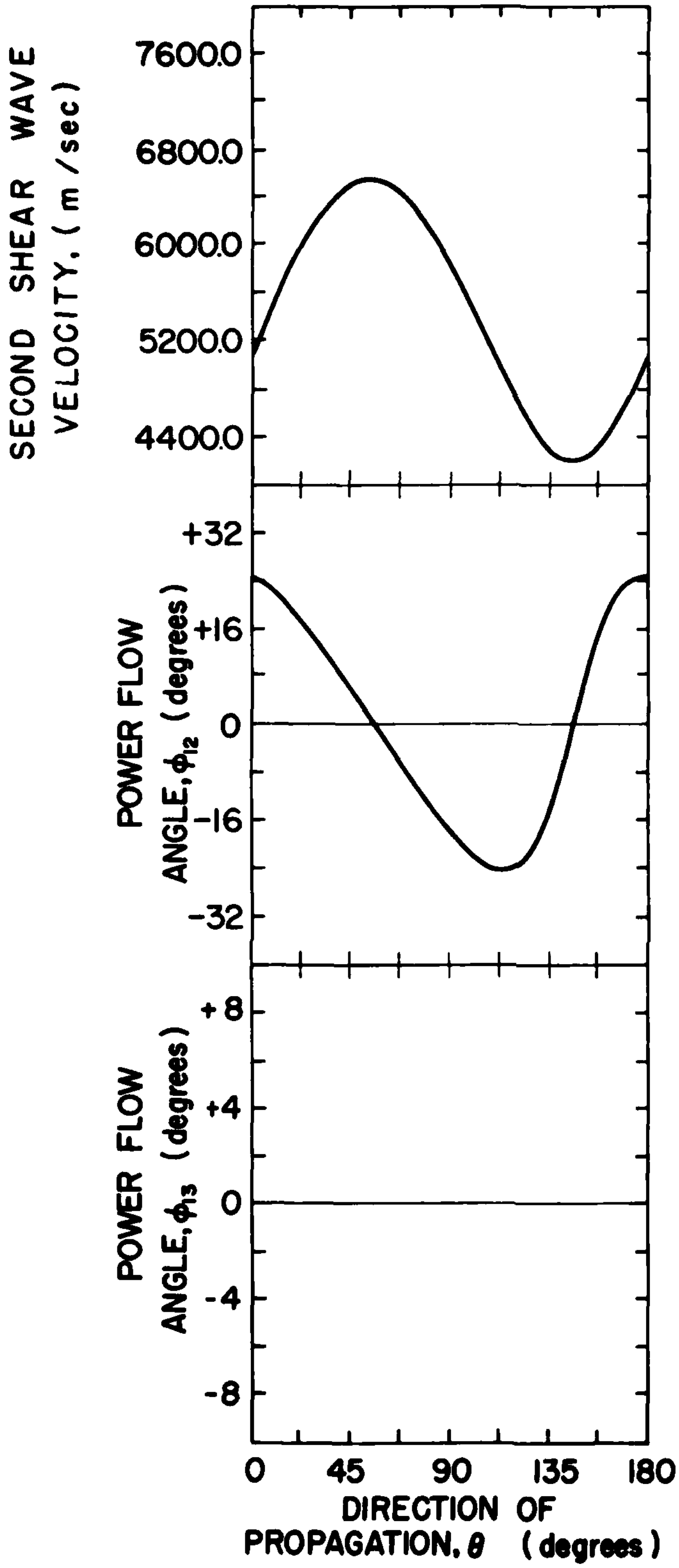


SECOND SHEAR WAVE VELOCITY, (m/sec)
5000.0
4800.0
4600.0
4400.0
4200.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+24
+12
0
-12
-24
POWER FLOW ANGLE, ϕ_{13} (degrees)
+16
+8
0
-8
-16
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
SPINEL



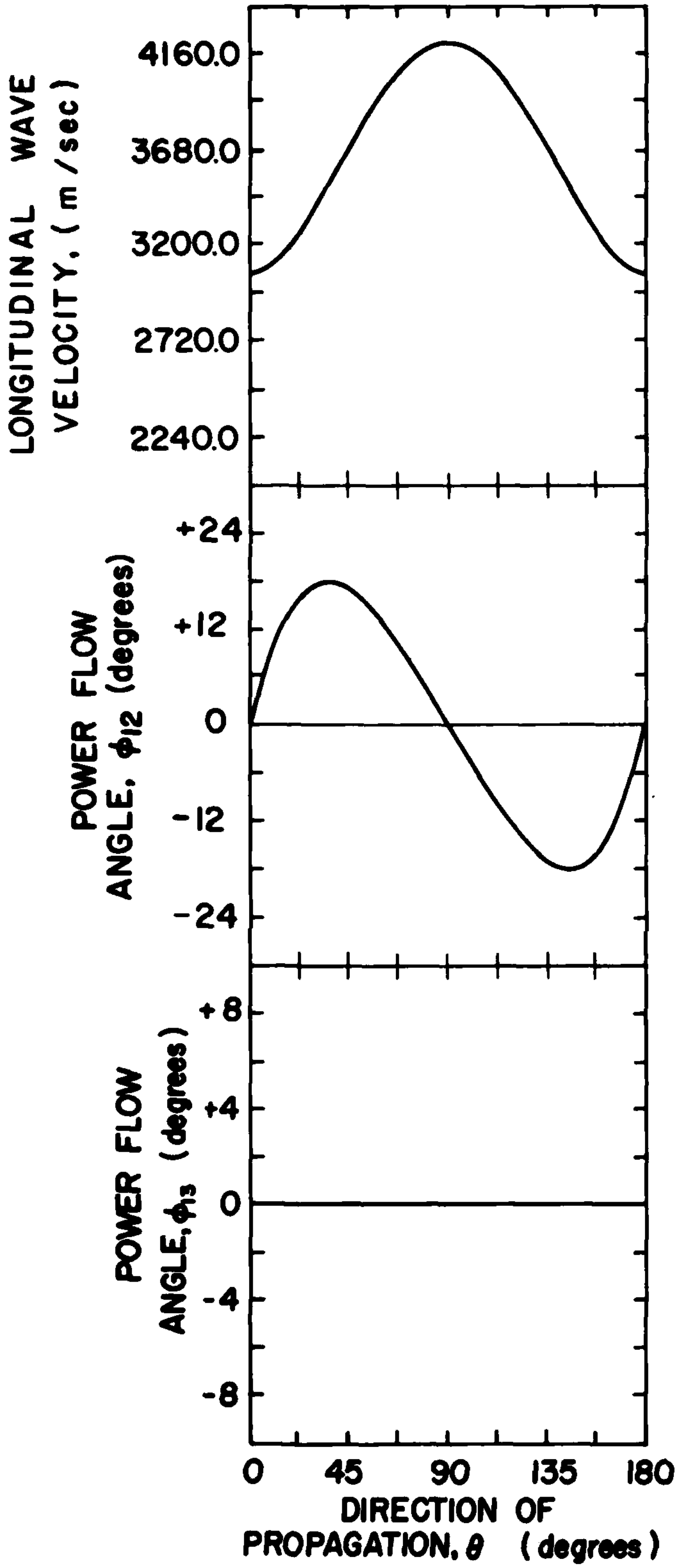
LONGITUDINAL WAVE VELOCITY, (m / sec)
11,600
10,800
10,000
9200
8400
POWER FLOW ANGLE, ϕ_{12} (degrees)
+16
+8
0
-8
-16
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE
SPINEL

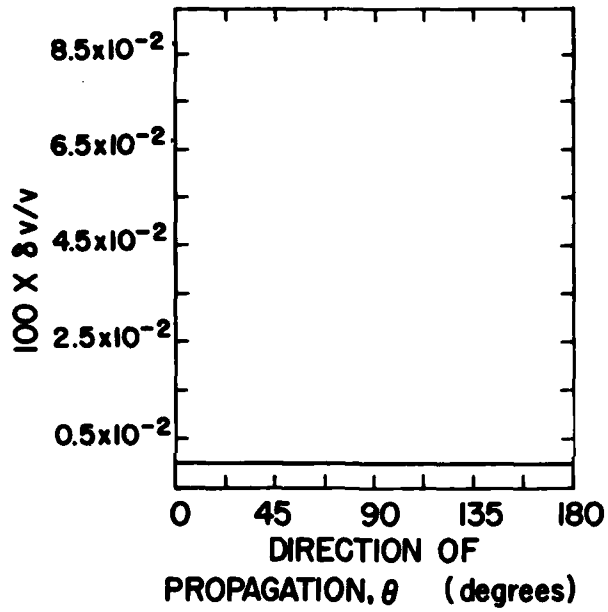

FIRST SHEAR WAVE VELOCITY, (m / sec)
7600.0
6800.0
6000.0
5200.0
4400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+32
+16
0
-16
-32
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE
SPINEL



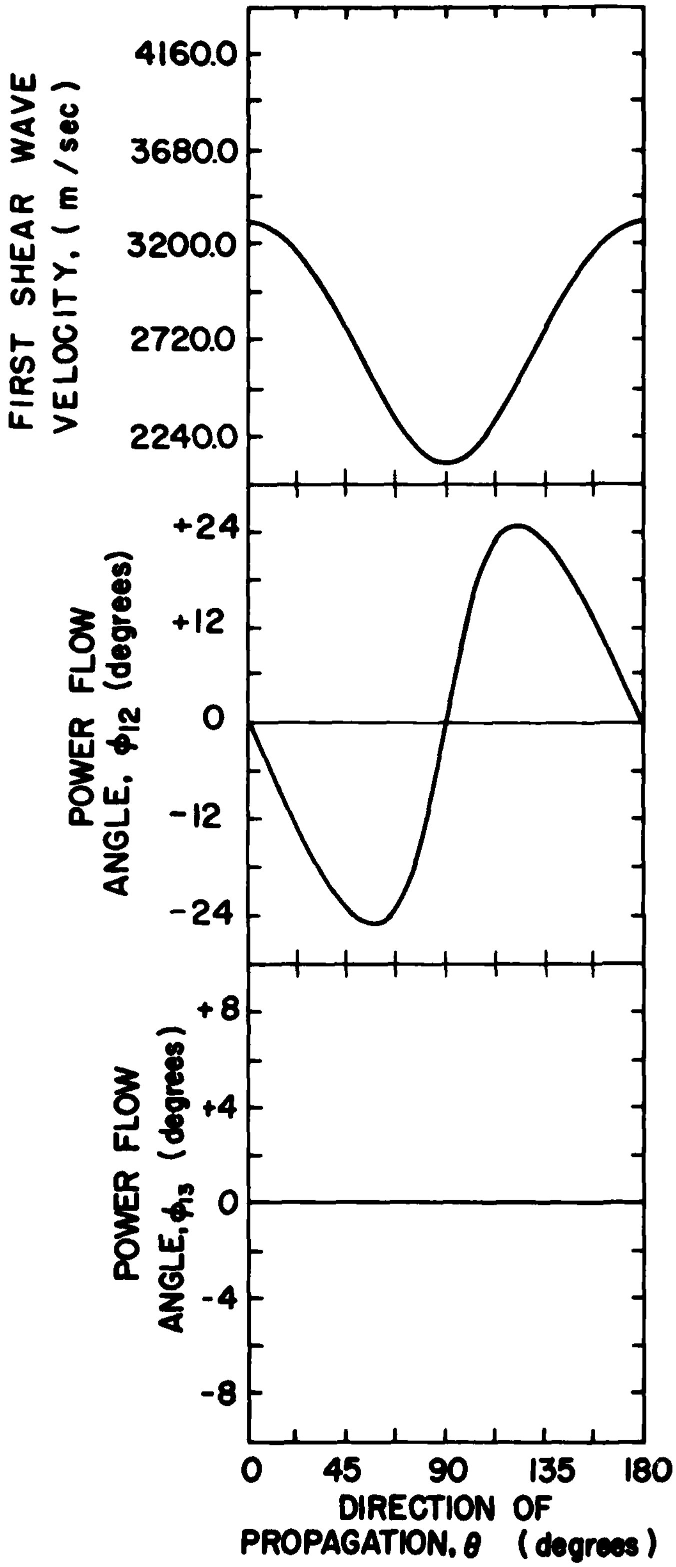
110-PLANE
SPINEL

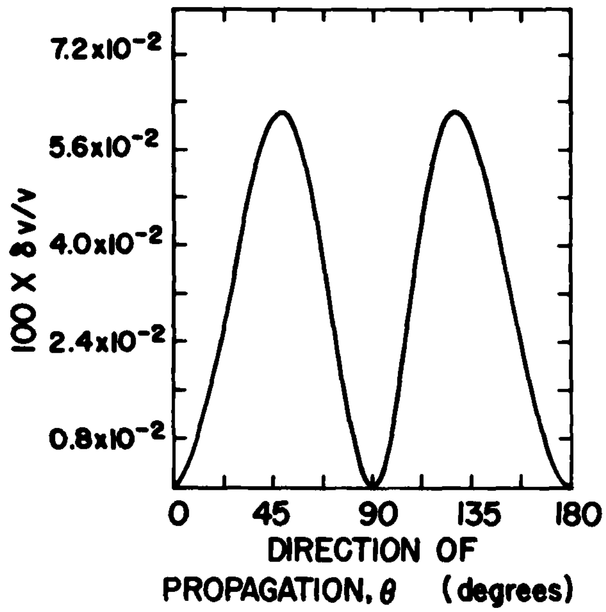
X-PLANE AND Y-PLANE
TeO_2

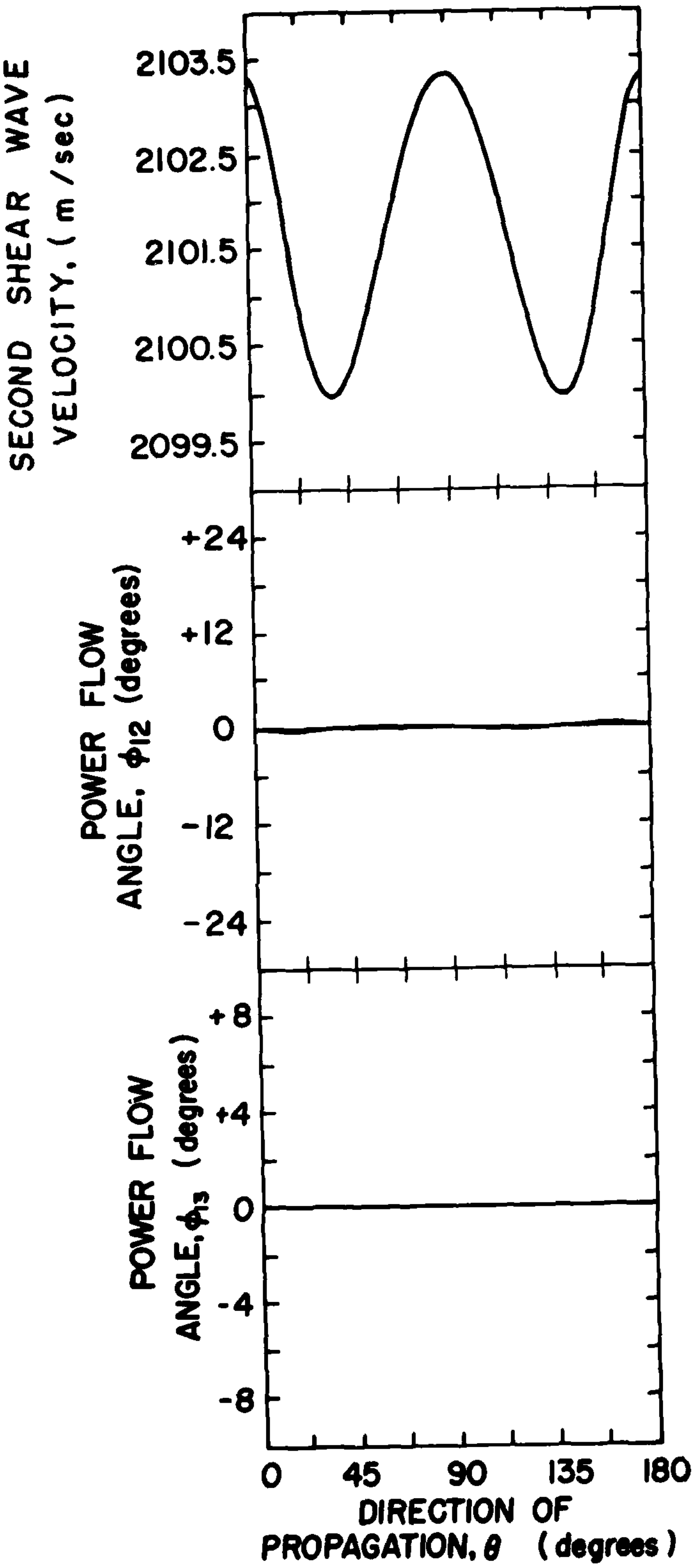




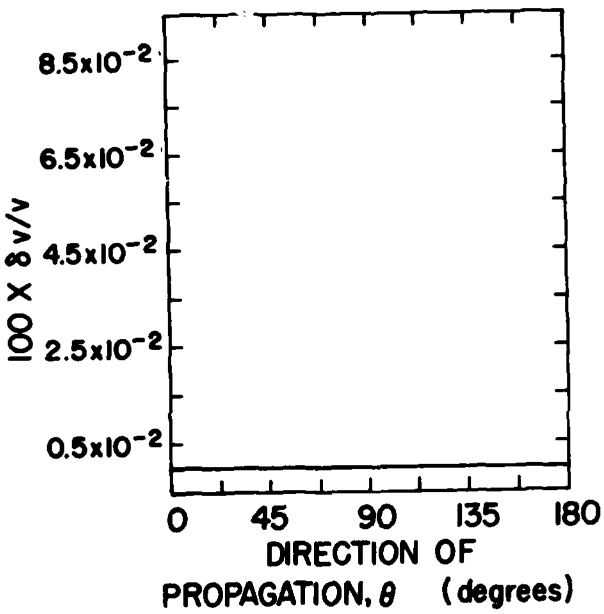
X-PLANE AND Y-PLANE TeO_2

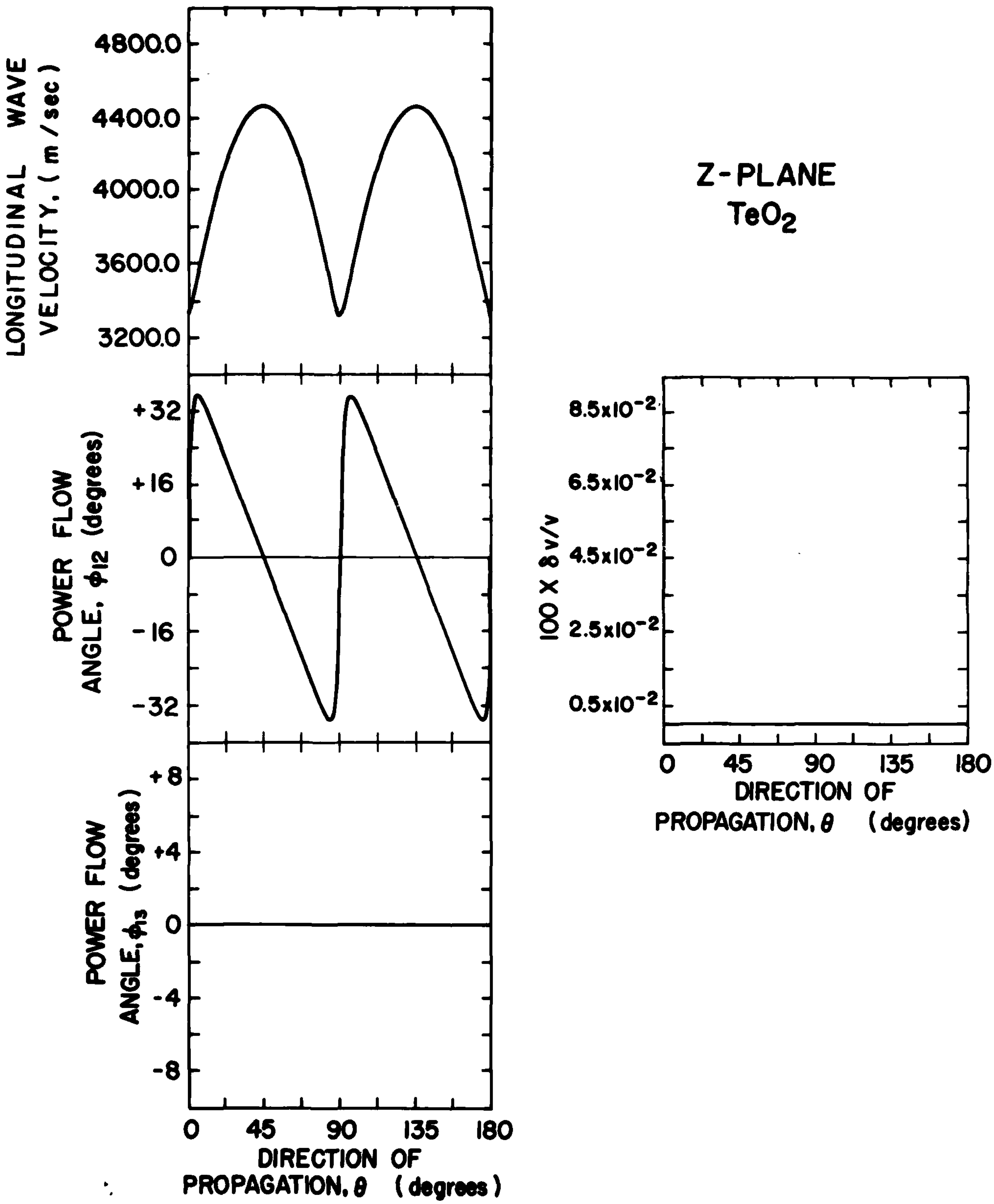




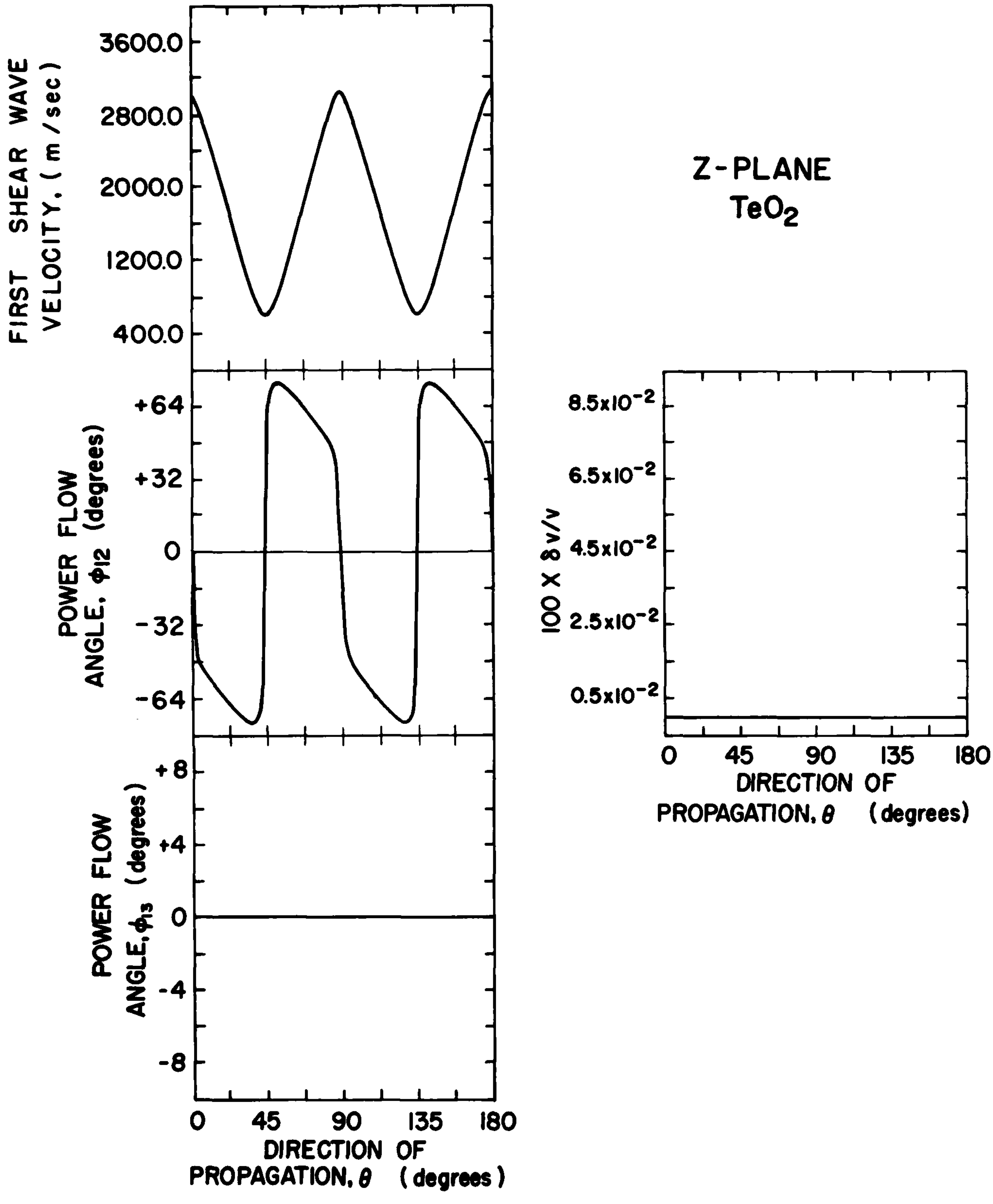


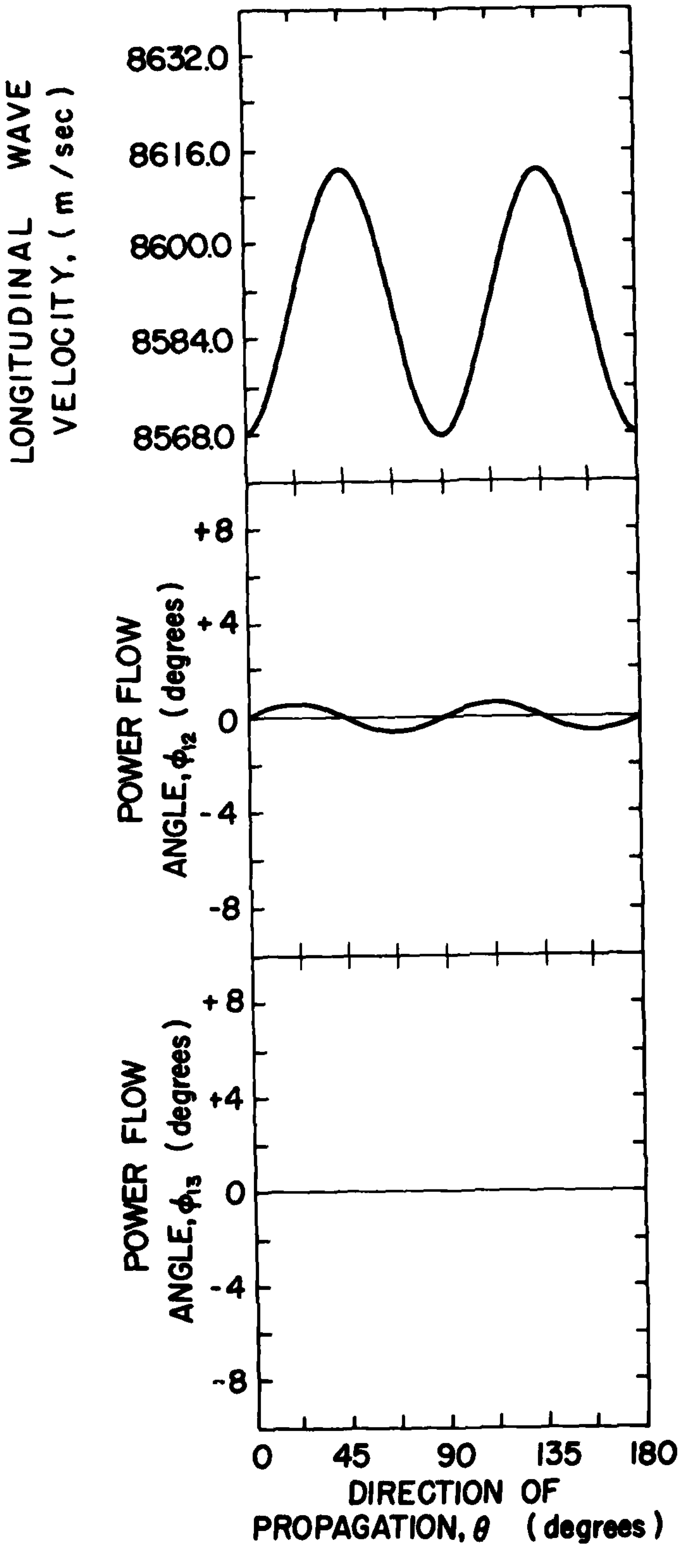
X-PLANE AND Y-PLANE
TeO_2



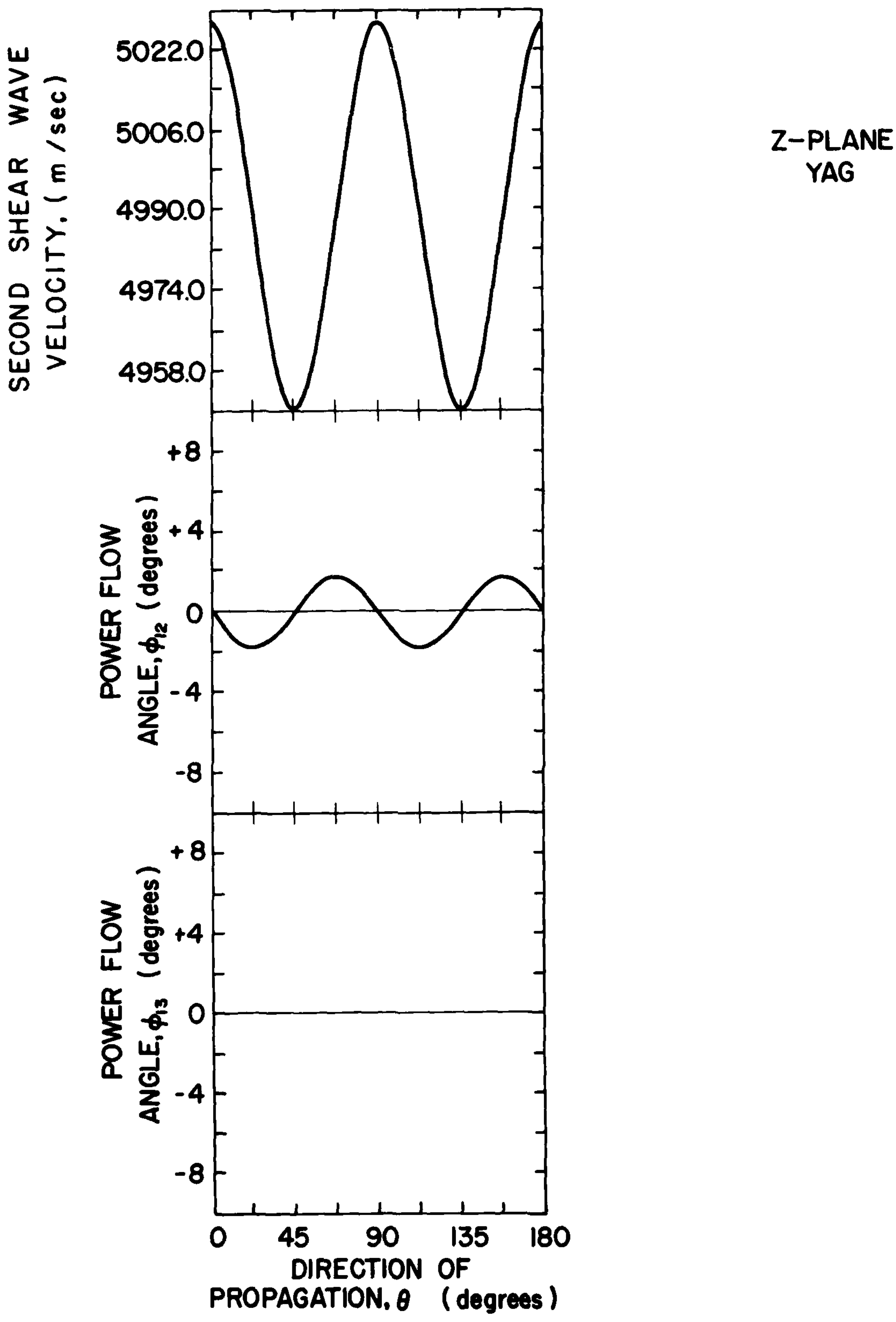


Z-PLANE
TeO_2
LONGITUDINAL WAVE VELOCITY, (m/sec)
4800.0
4400.0
4000.0
3600.0
3200.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+32
+16
0
-16
-32
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

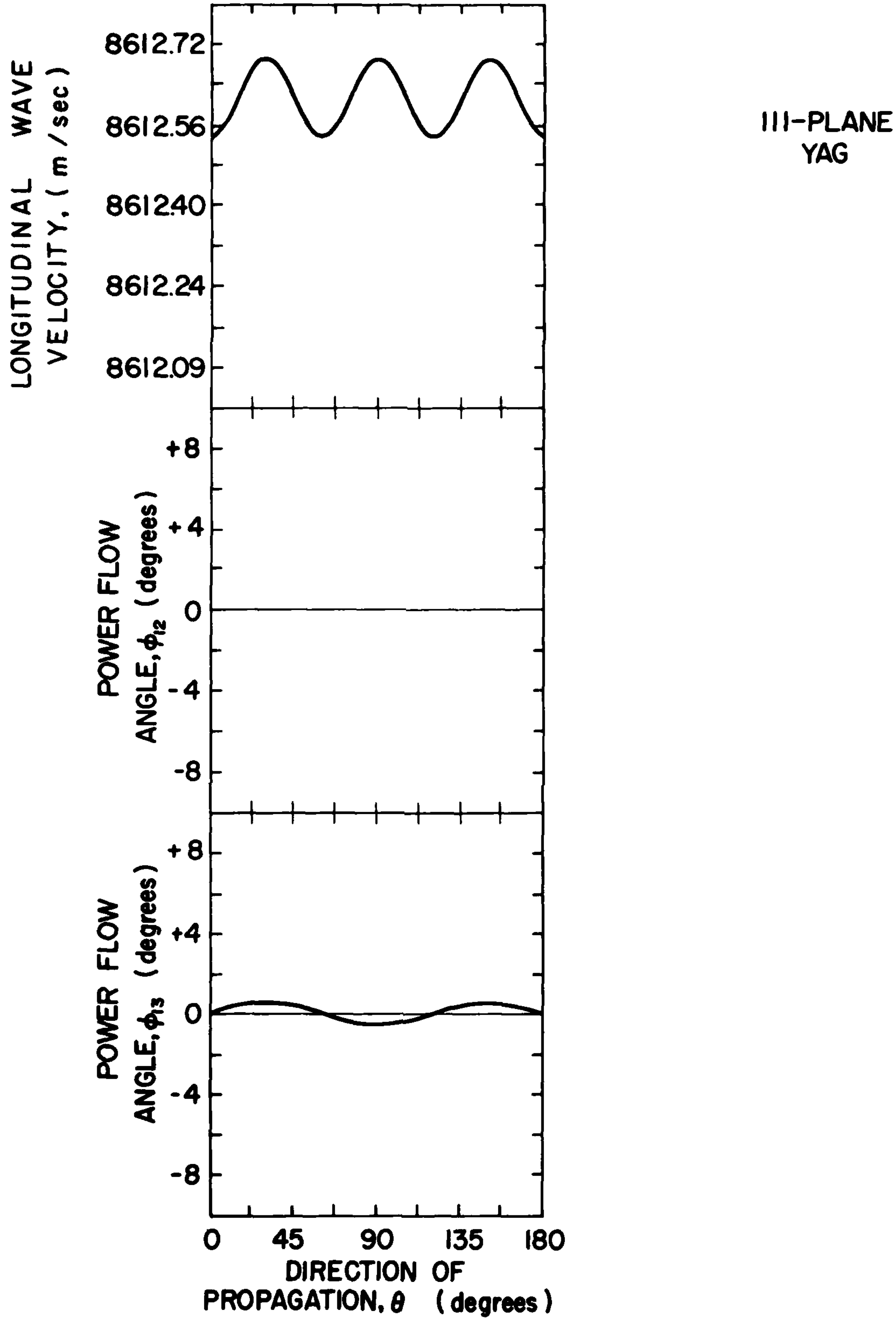

Z-PLANE
TeO_2
FIRST SHEAR WAVE VELOCITY, (m/sec)
3600.0
2800.0
2000.0
1200.0
400.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+64
+32
0
-32
-64
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
$100 \times \delta v/v$
8.5×10^{-2}
6.5×10^{-2}
4.5×10^{-2}
2.5×10^{-2}
0.5×10^{-2}
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

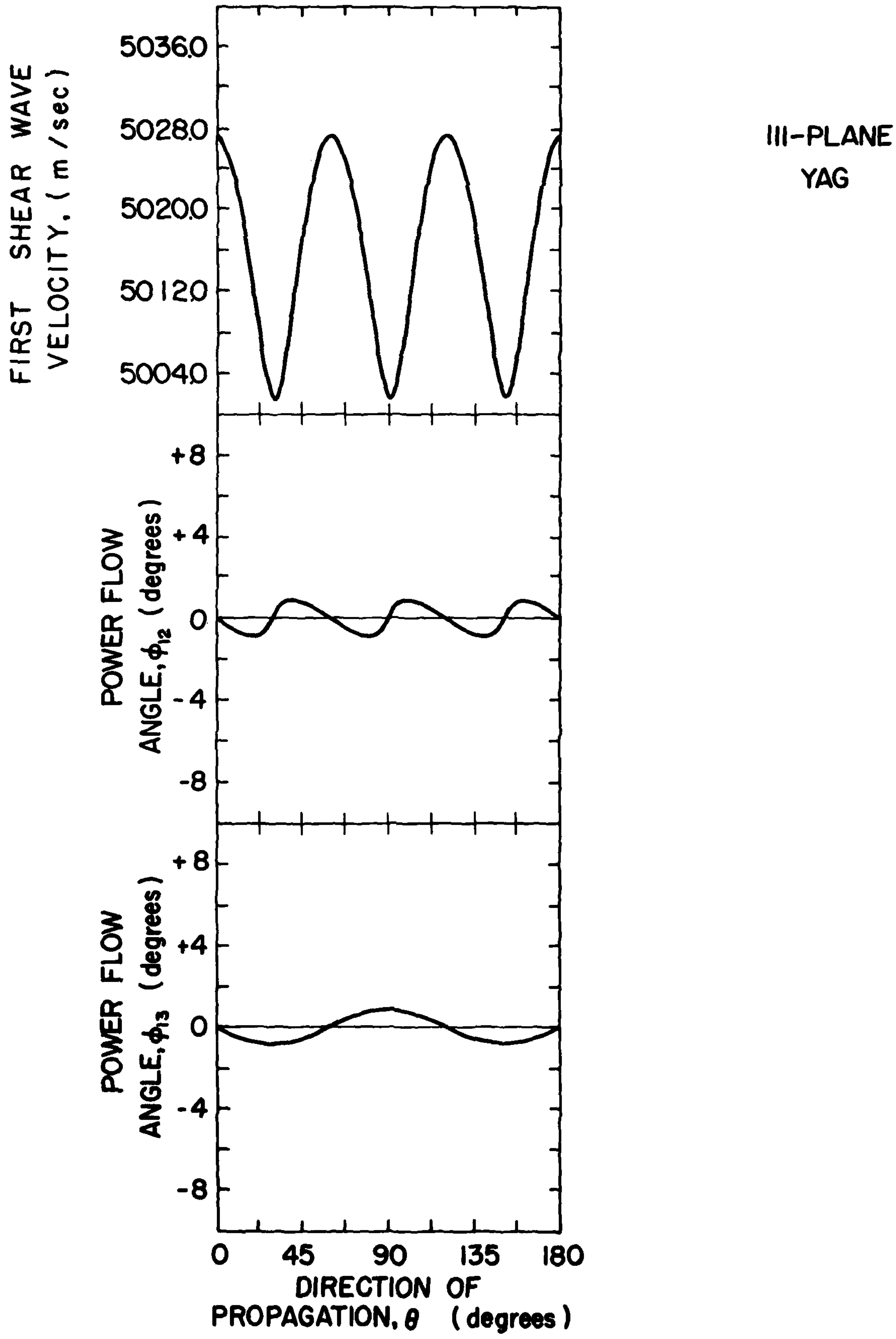

LONGITUDINAL WAVE VELOCITY, (m /sec)
8632.0
8616.0
8600.0
8584.0
8568.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)

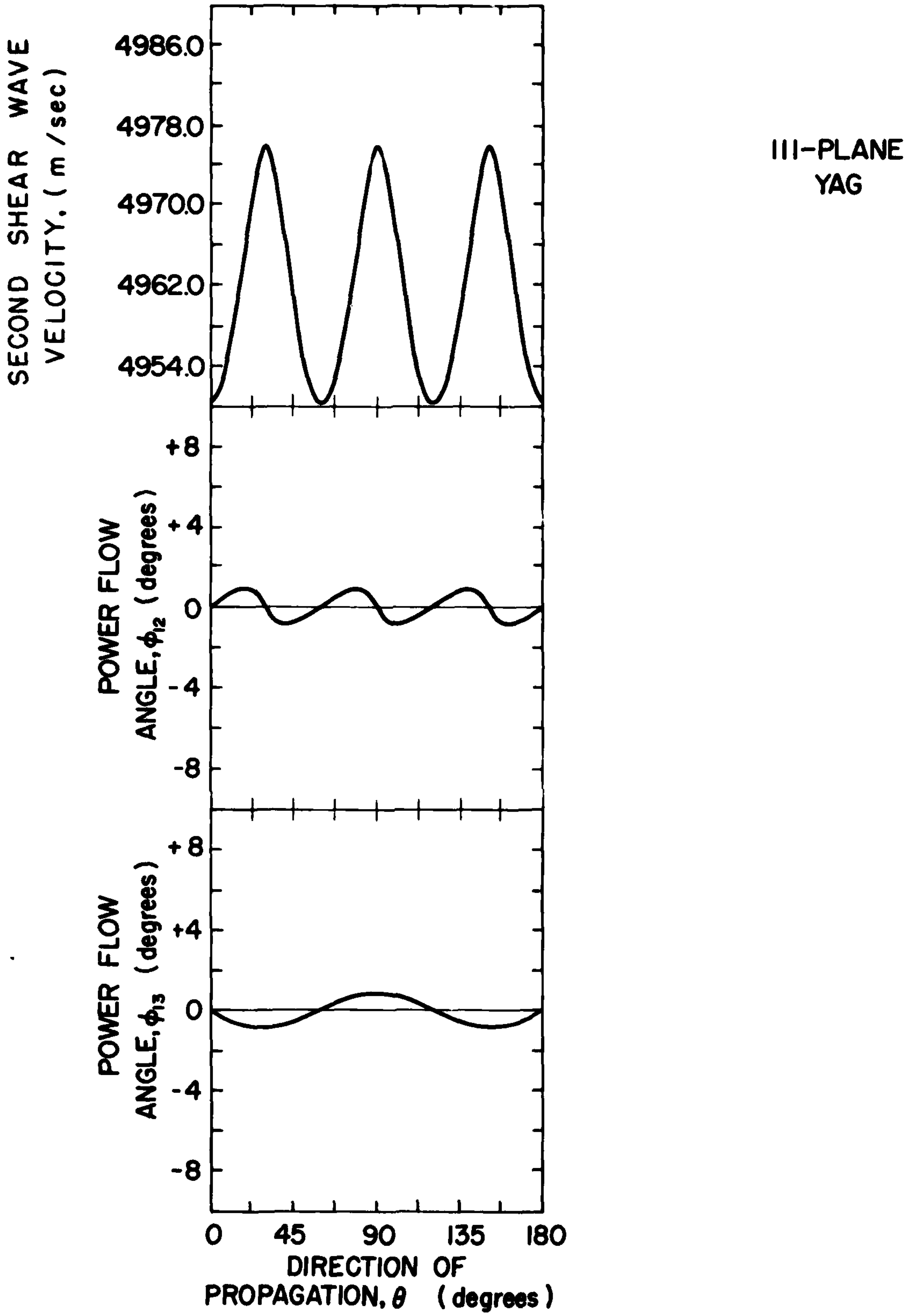
Z-PLANE
YAG

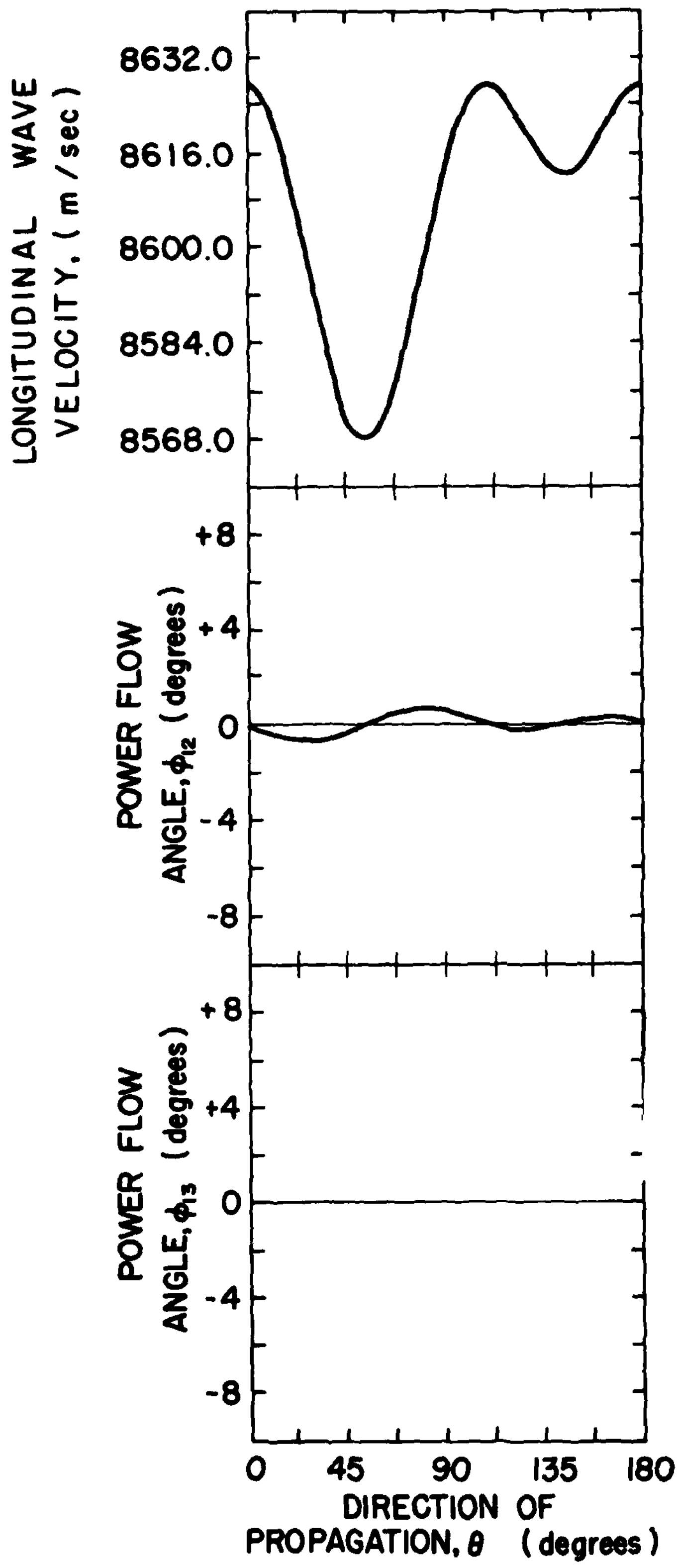


SECOND SHEAR WAVE VELOCITY, (m/sec)
5022.0
5006.0
4990.0
4974.0
4958.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
YAG

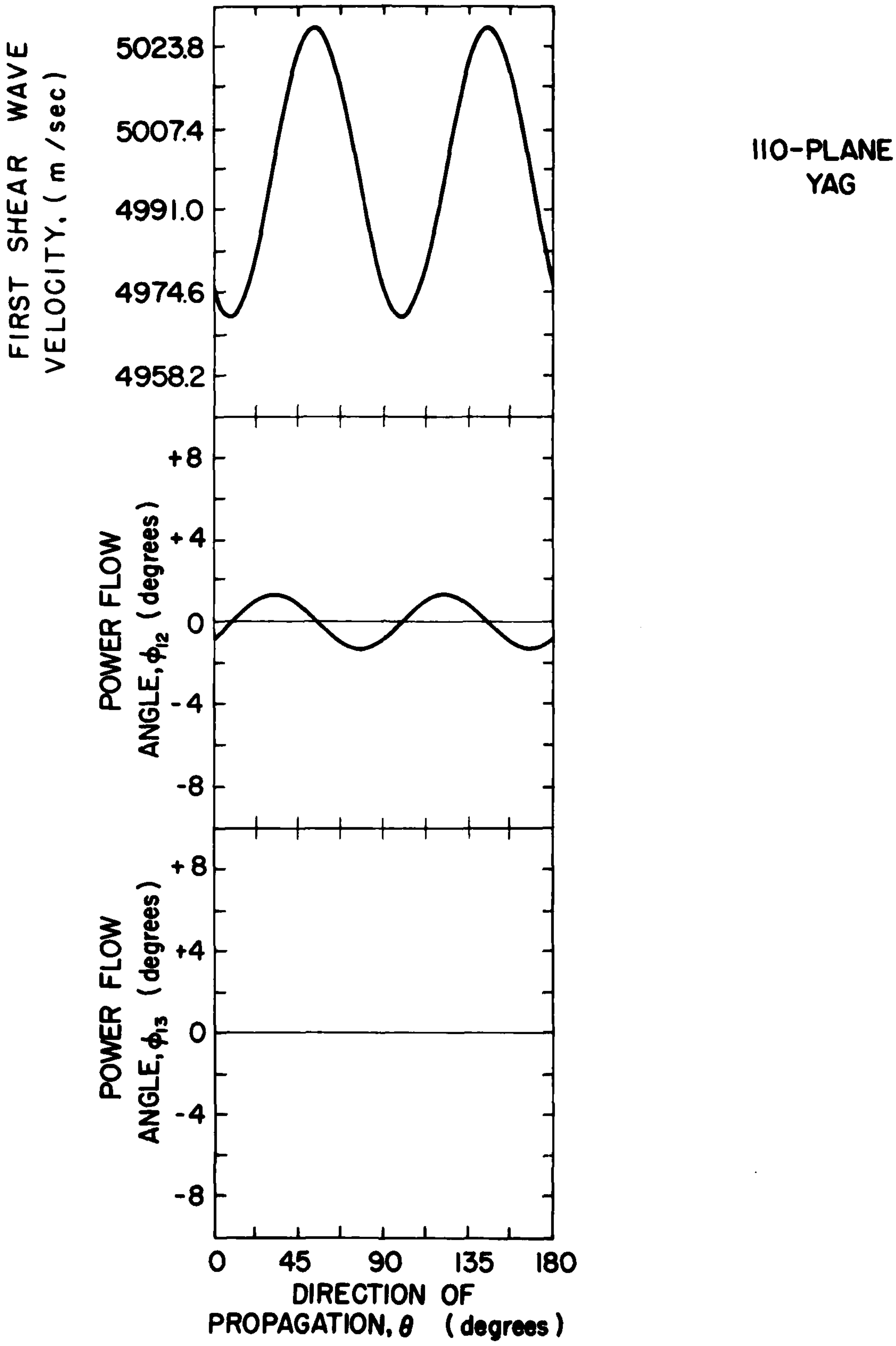

8612.72
8612.56
8612.40
8612.24
8612.09
LONGITUDINAL WAVE VELOCITY, (m / sec)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
YAG

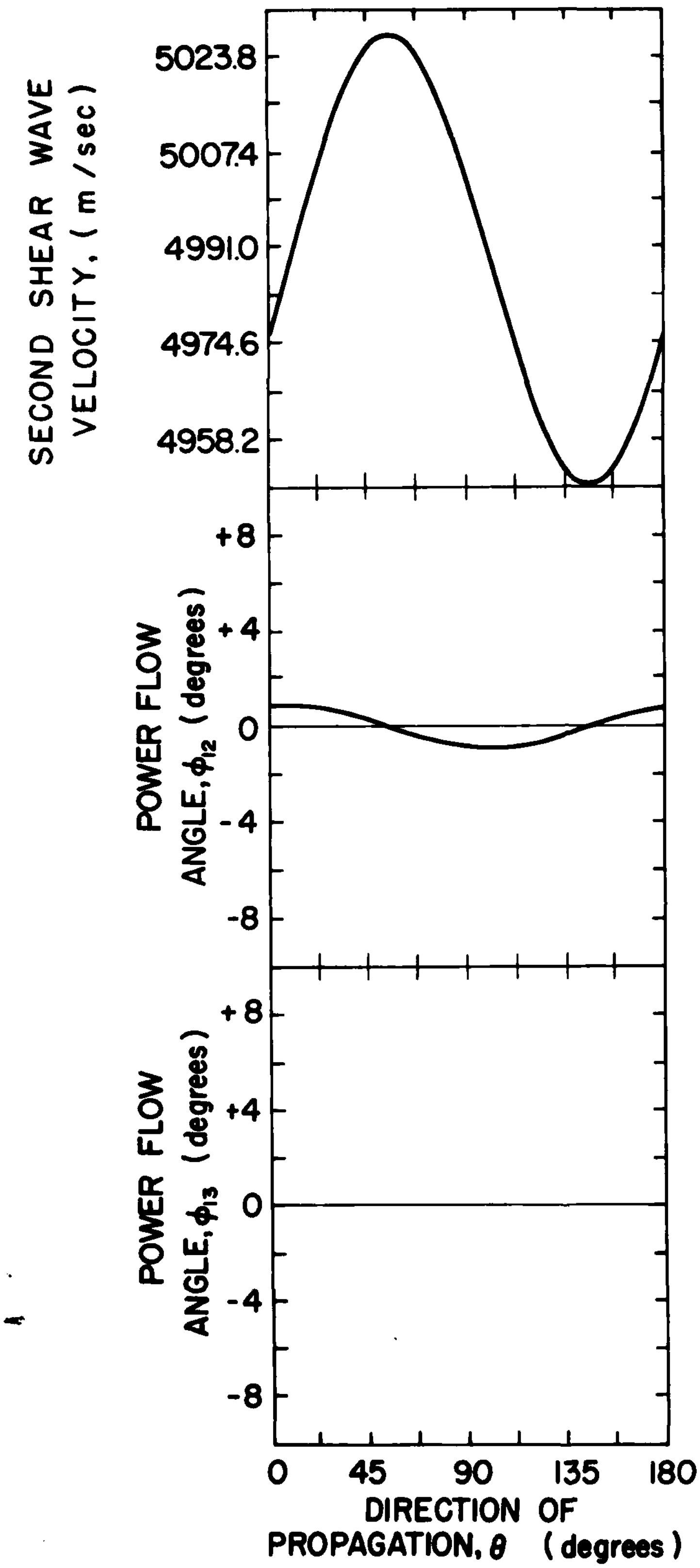

FIRST SHEAR WAVE VELOCITY, (m / sec)
5036.0
5028.0
5020.0
5012.0
5004.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
YAG


SECOND SHEAR WAVE VELOCITY, (m/sec)
4986.0
4978.0
4970.0
4962.0
4954.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
YAG

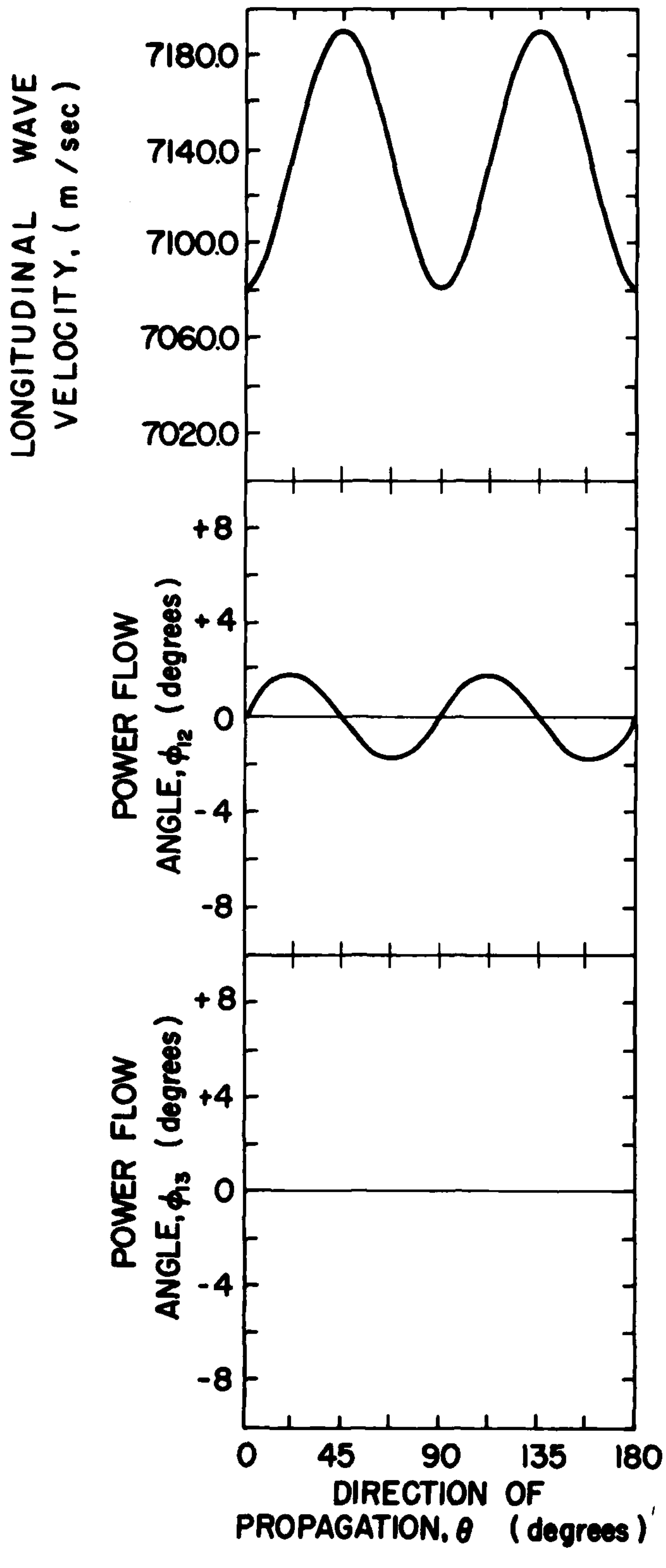


110 - PLANE
YAG

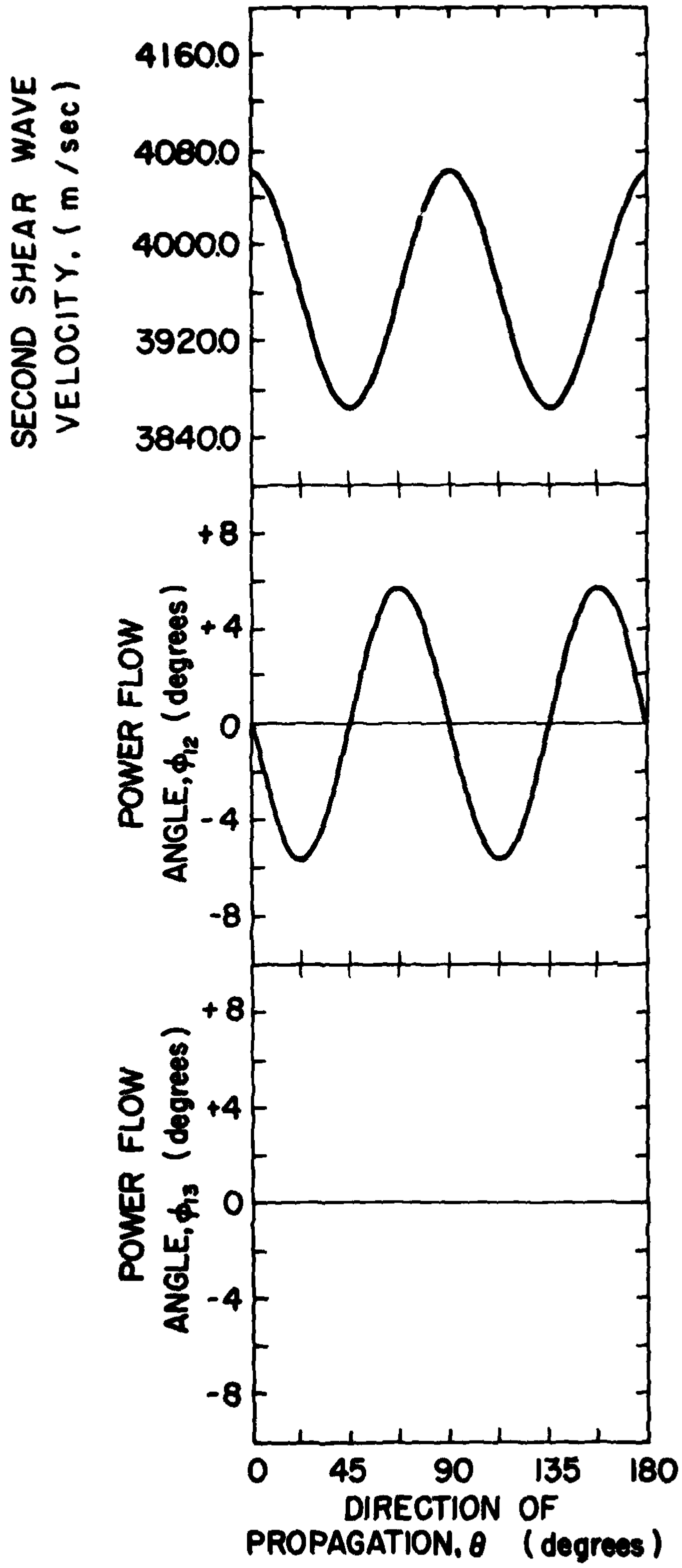

FIRST SHEAR WAVE VELOCITY, (m/sec)
5023.8
5007.4
4991.0
4974.6
4958.2
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
110-PLANE
YAG



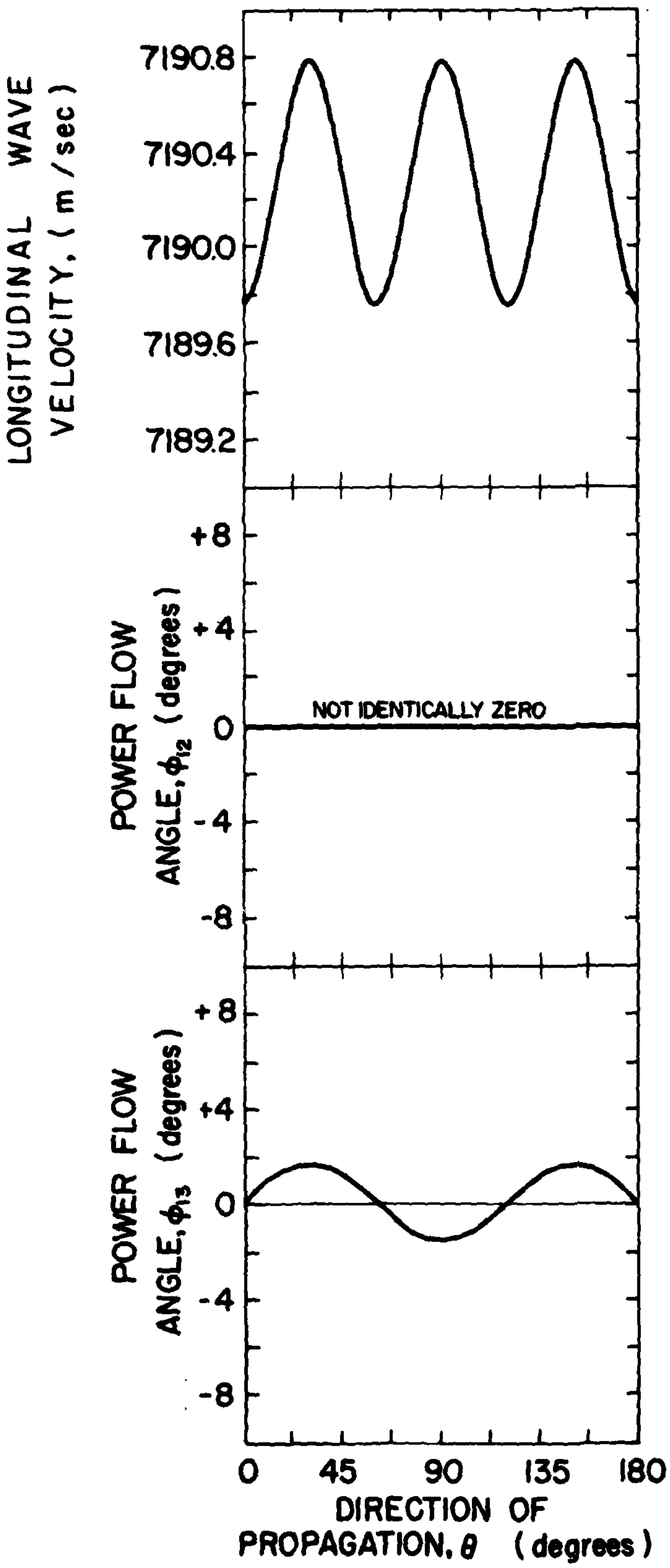
110-PLANE
YAG



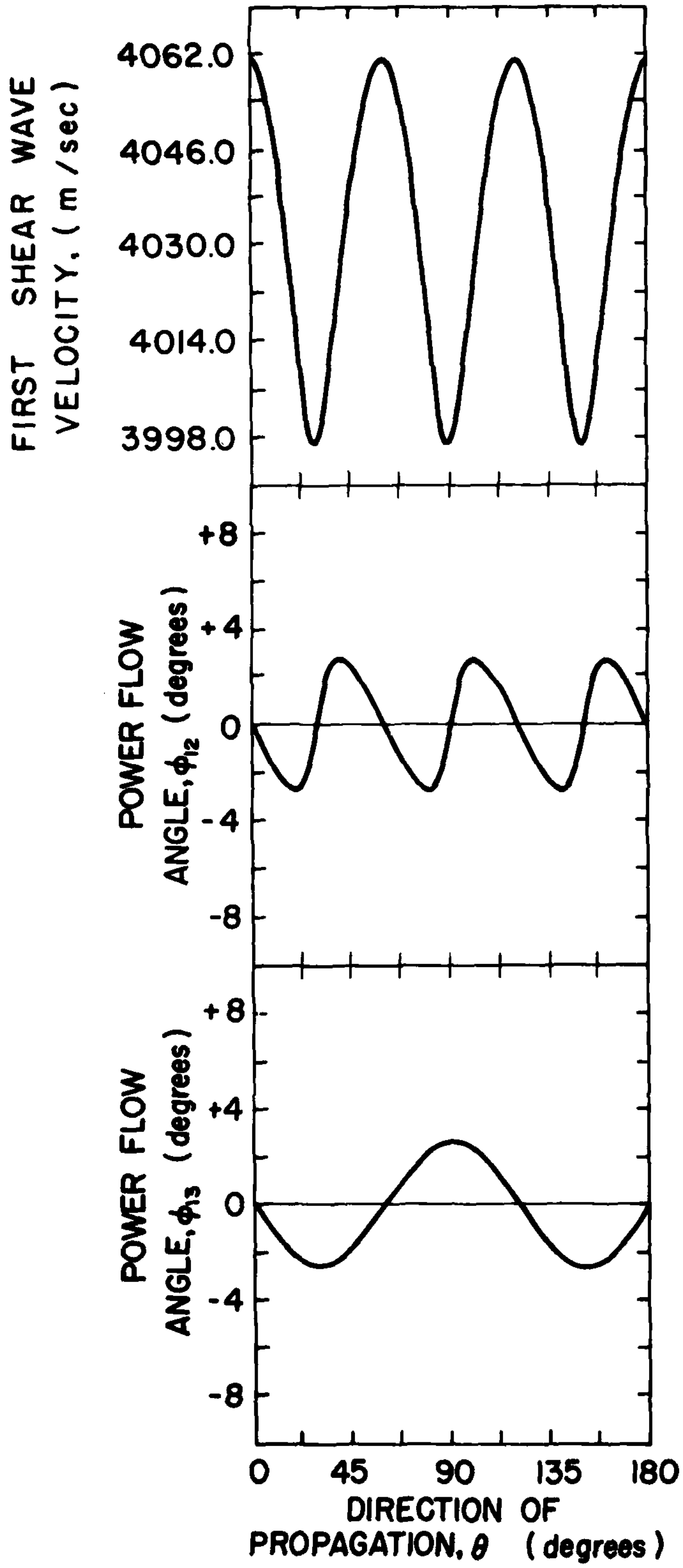
Z-PLANE
YTTRIUM GALLIUM GARNET



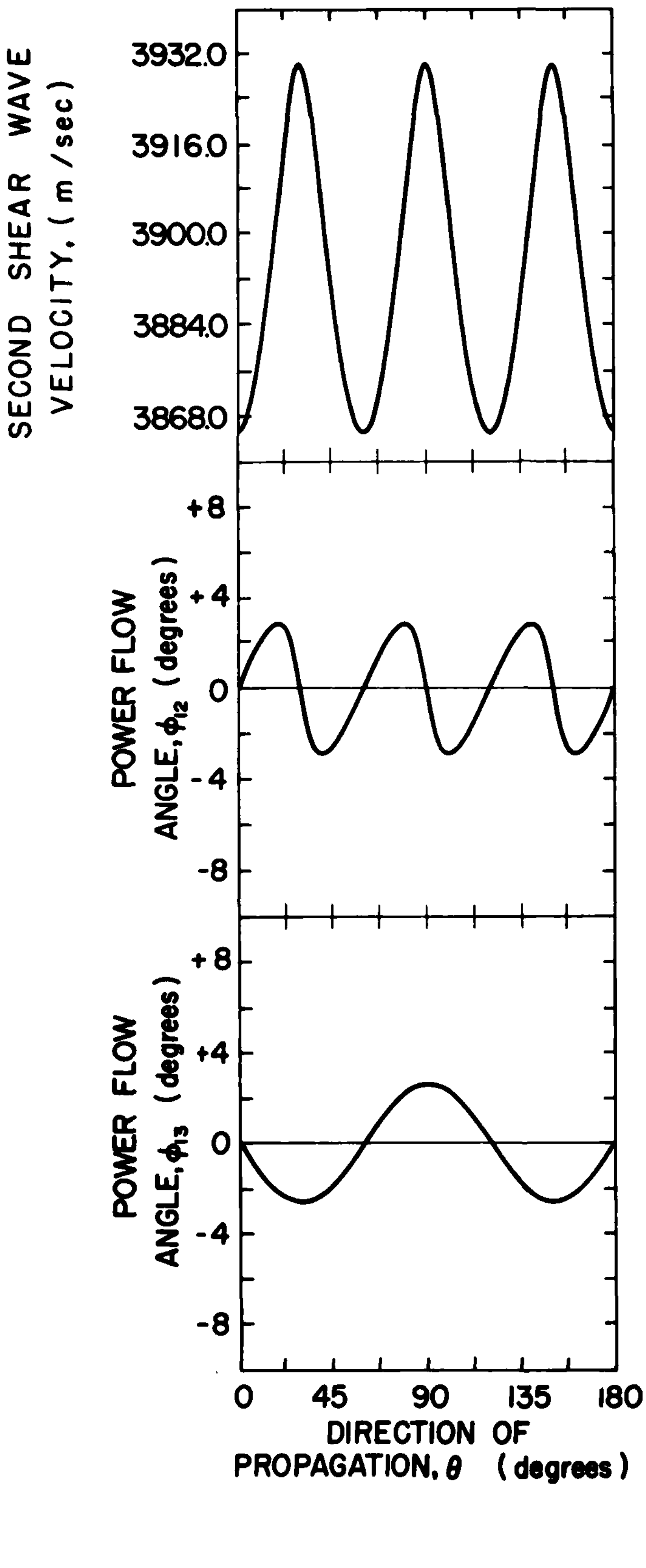
Z-PLANE
YTTRIUM GALLIUM GARNET



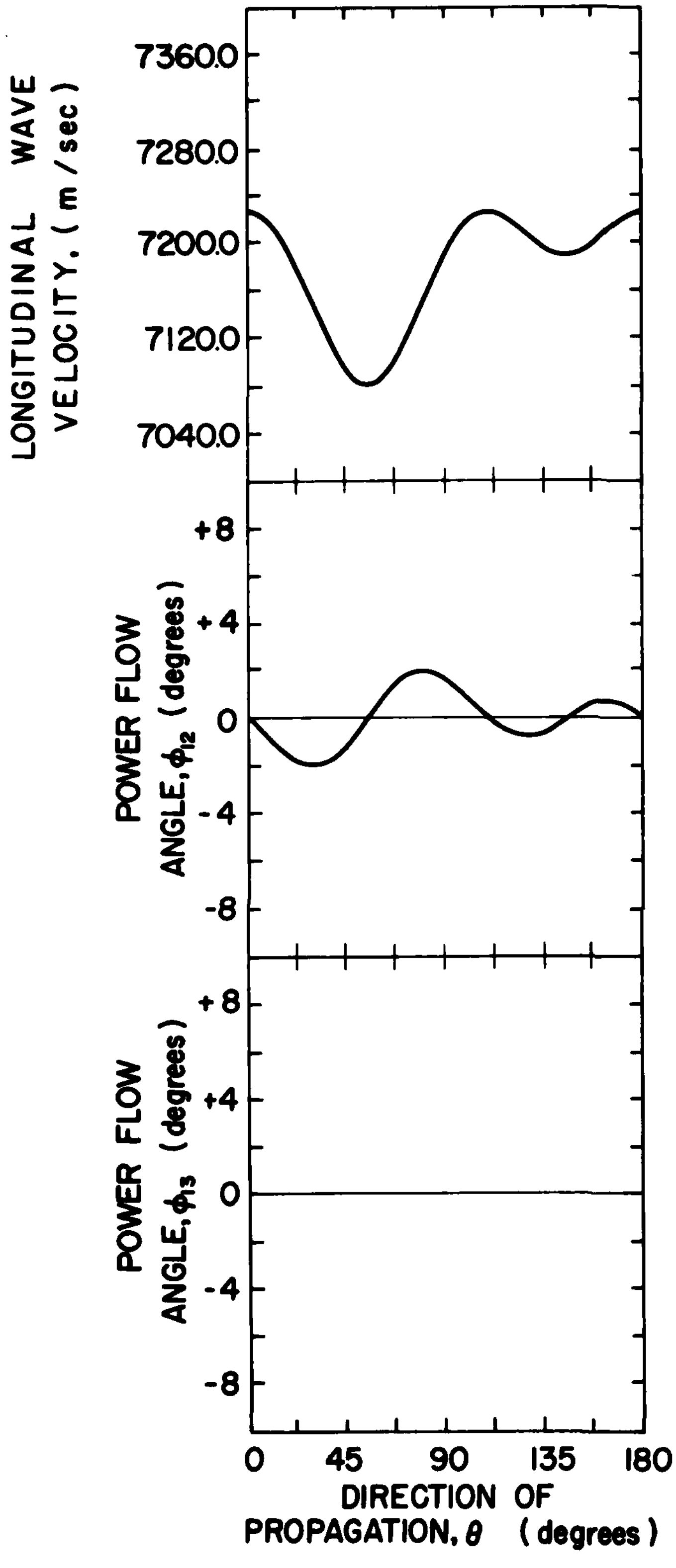
111-PLANE
YTTRIUM GALLIUM GARNET



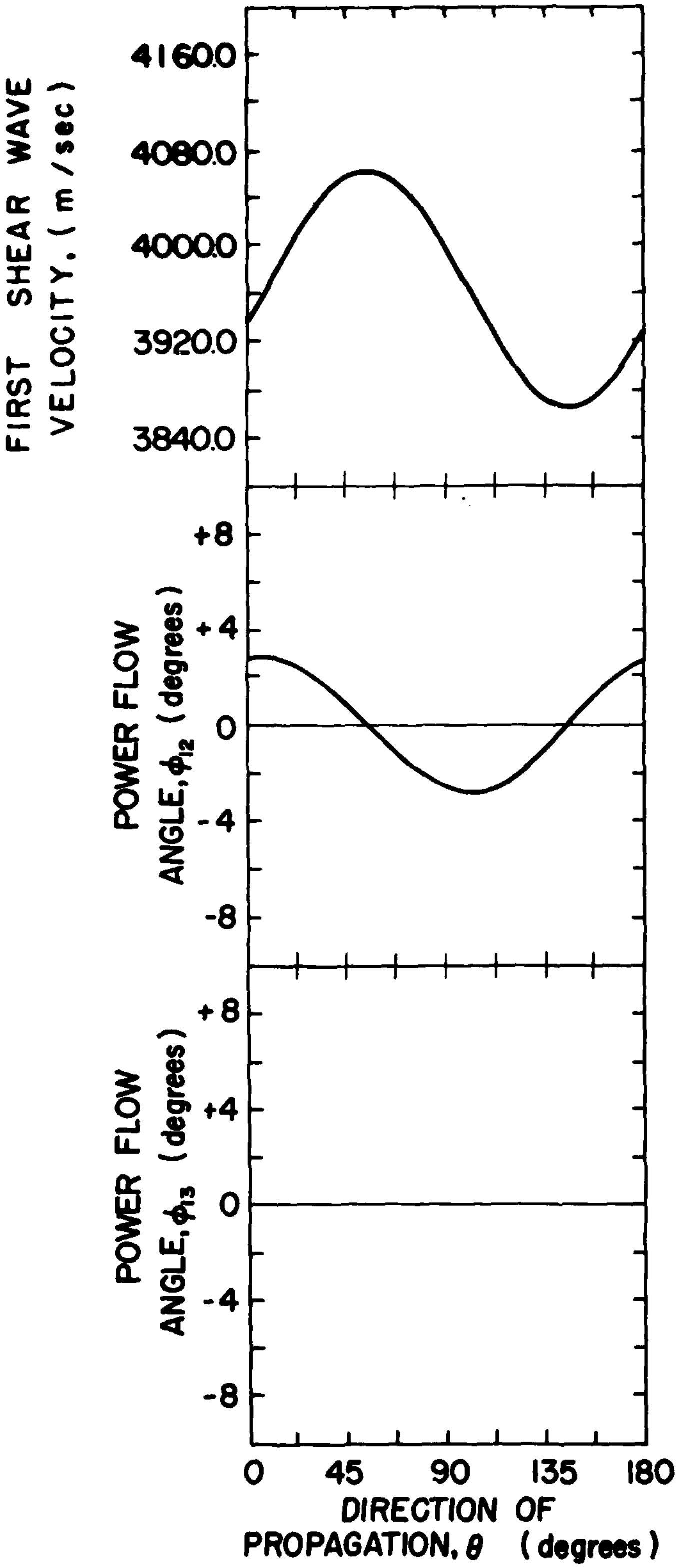
111-PLANE
YTTRIUM GALLIUM GARNET



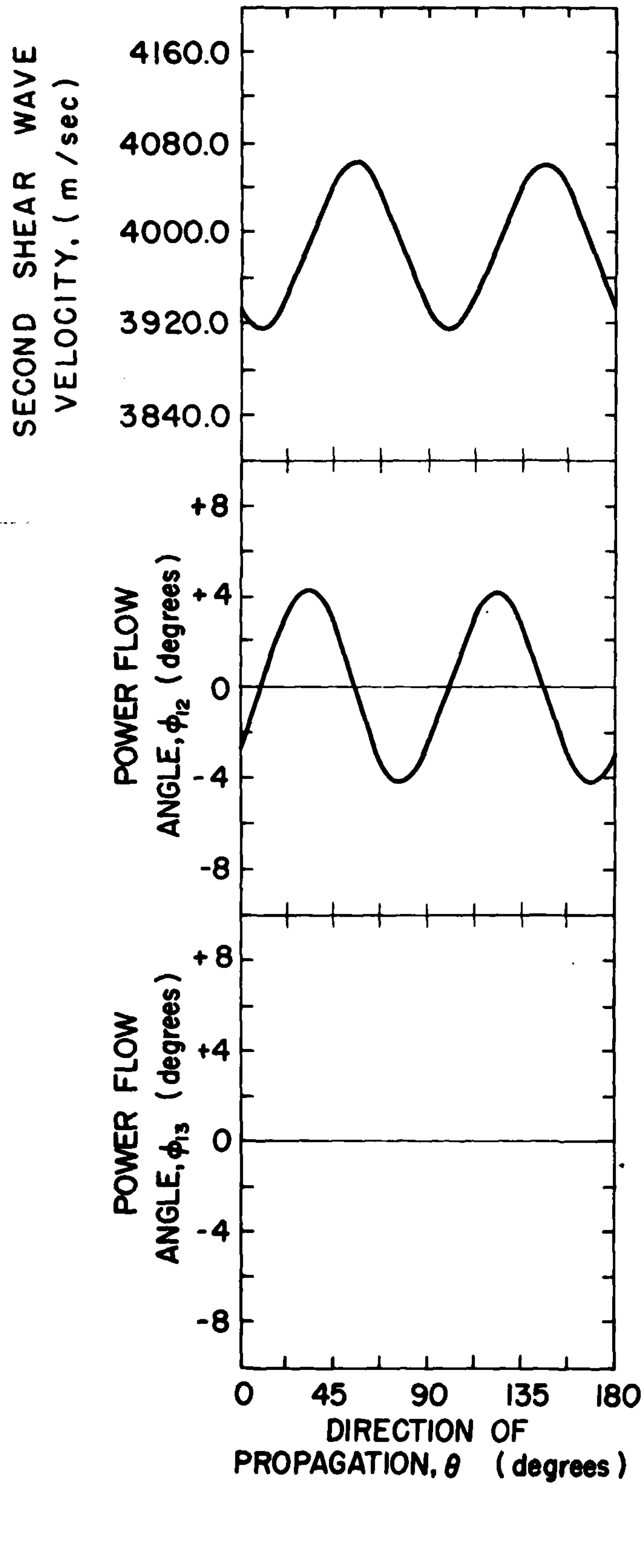
111-PLANE
YTTRIUM GALLIUM GARNET



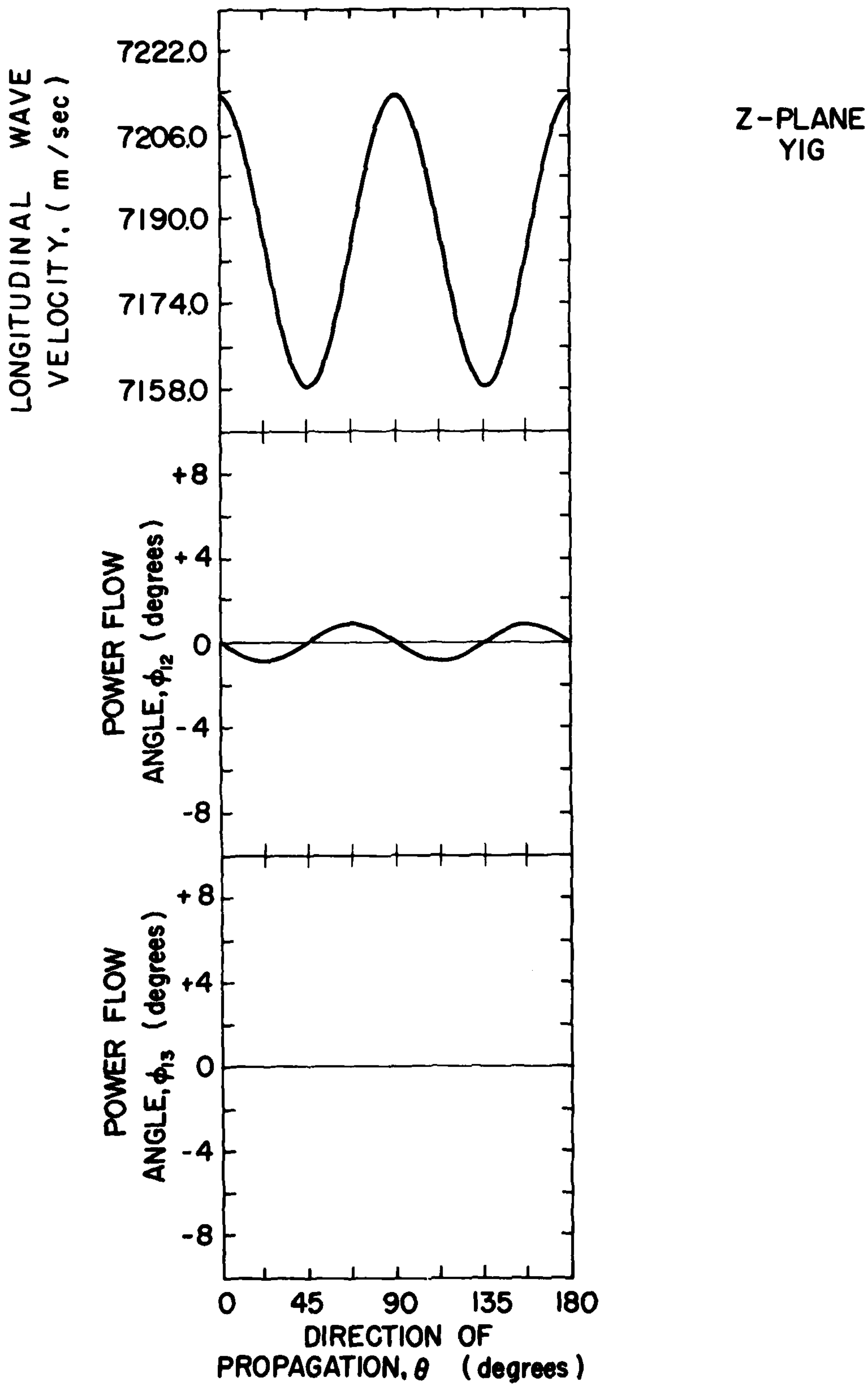
110-PLANE
YTTRIUM GALLIUM GARNET

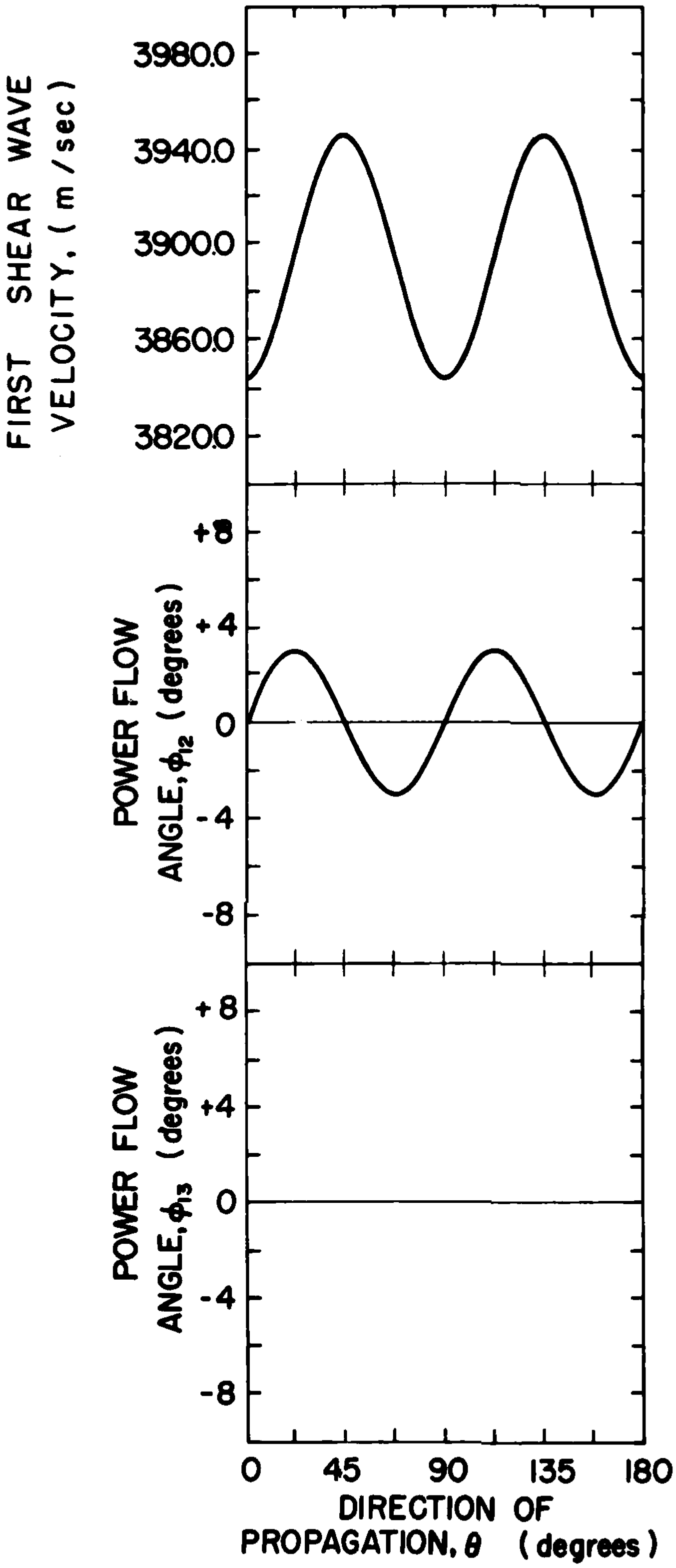


110-PLANE
YTTRIUM GALLIUM GARNET

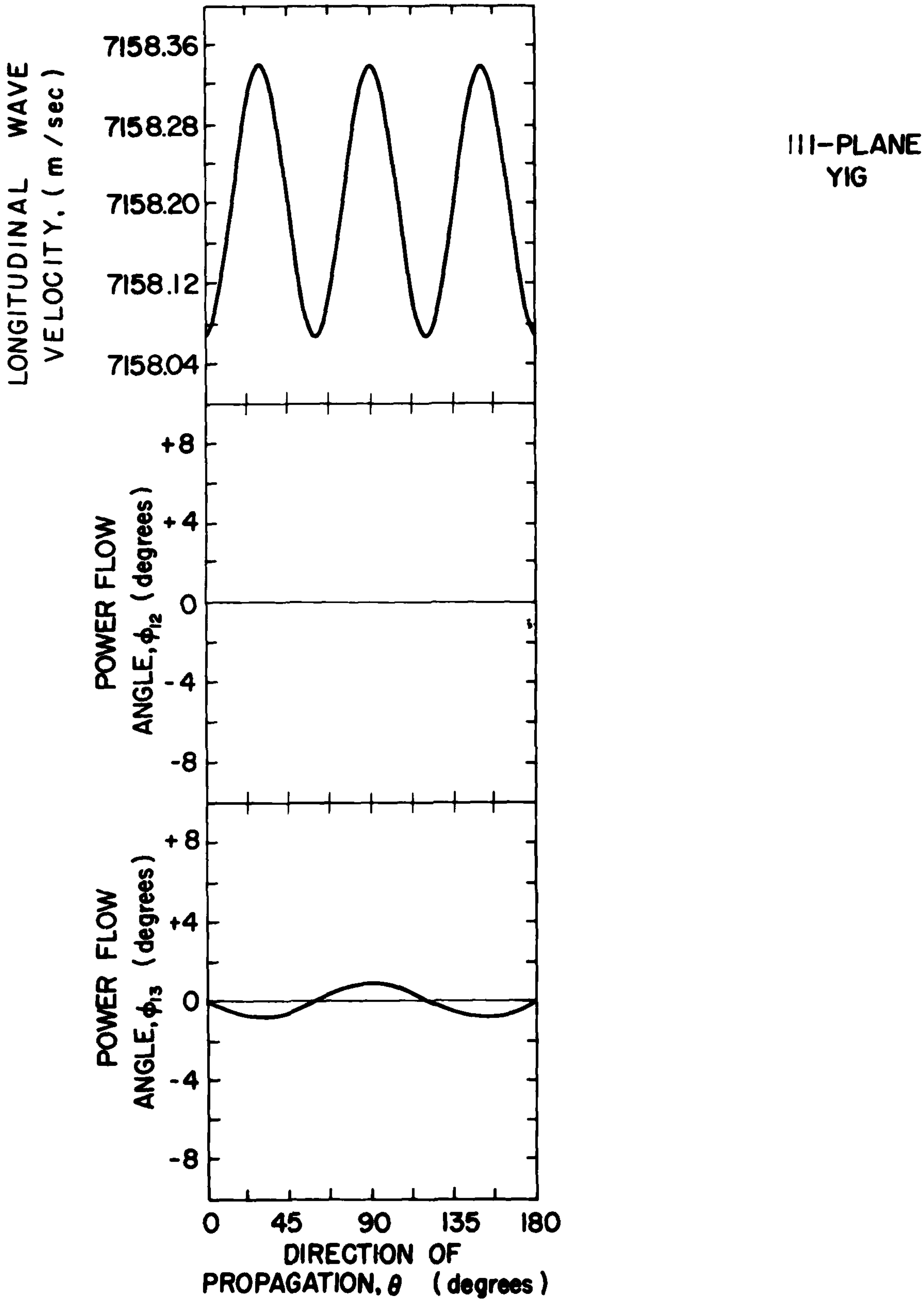


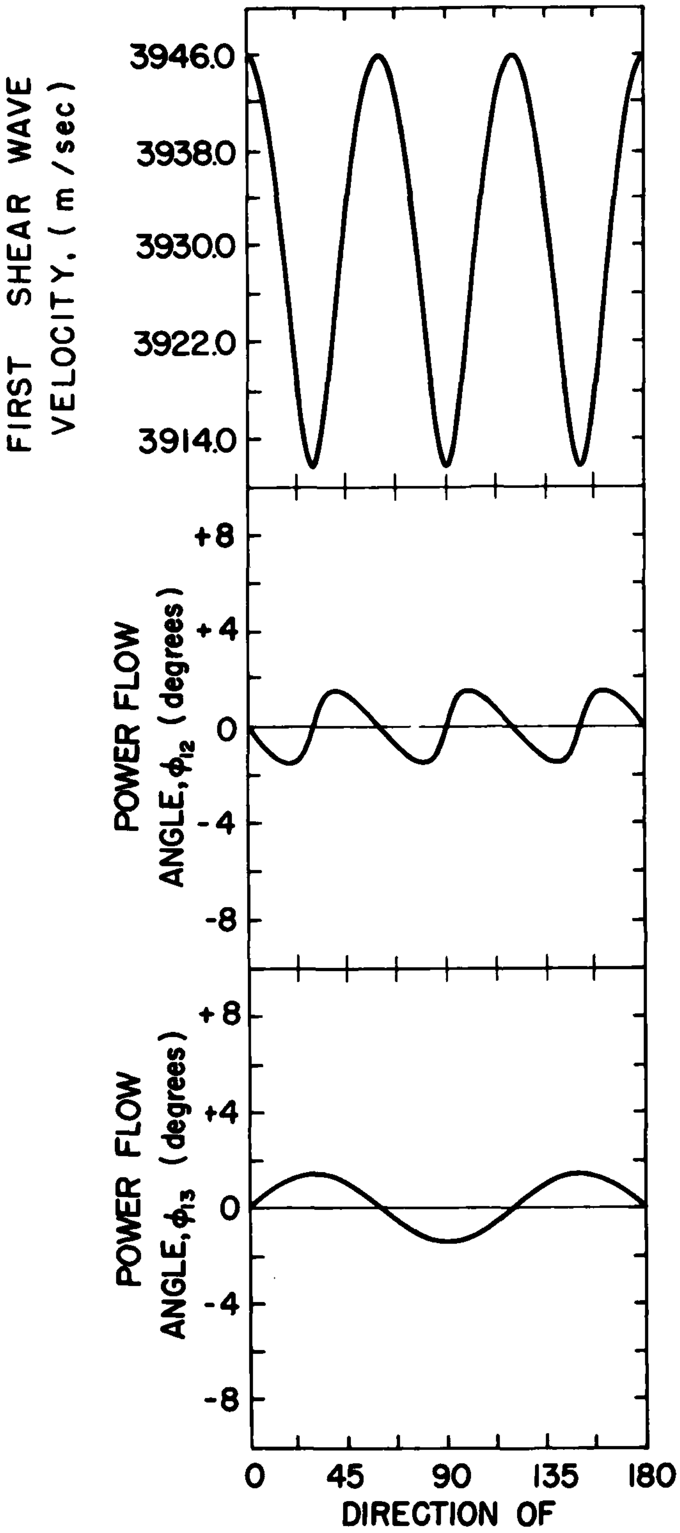
110 - PLANE
YTTRIUM GALLIUM GARNET


LONGITUDINAL WAVE VELOCITY, (m/sec)
7222.0
7206.0
7190.0
7174.0
7158.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
Z-PLANE
YIG

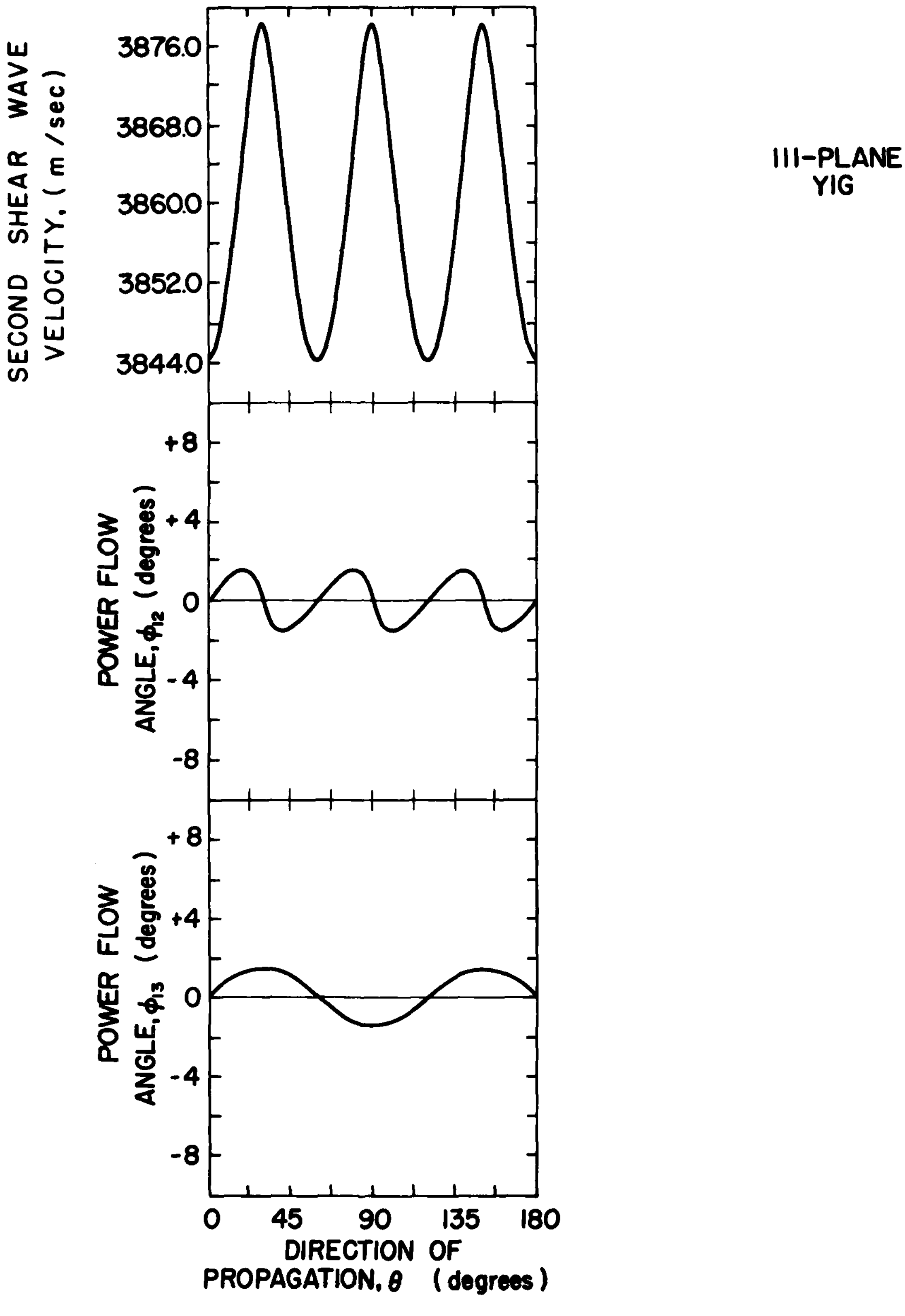

FIRST SHEAR WAVE VELOCITY, (m / sec)
3980.0
3940.0
3900.0
3860.0
3820.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

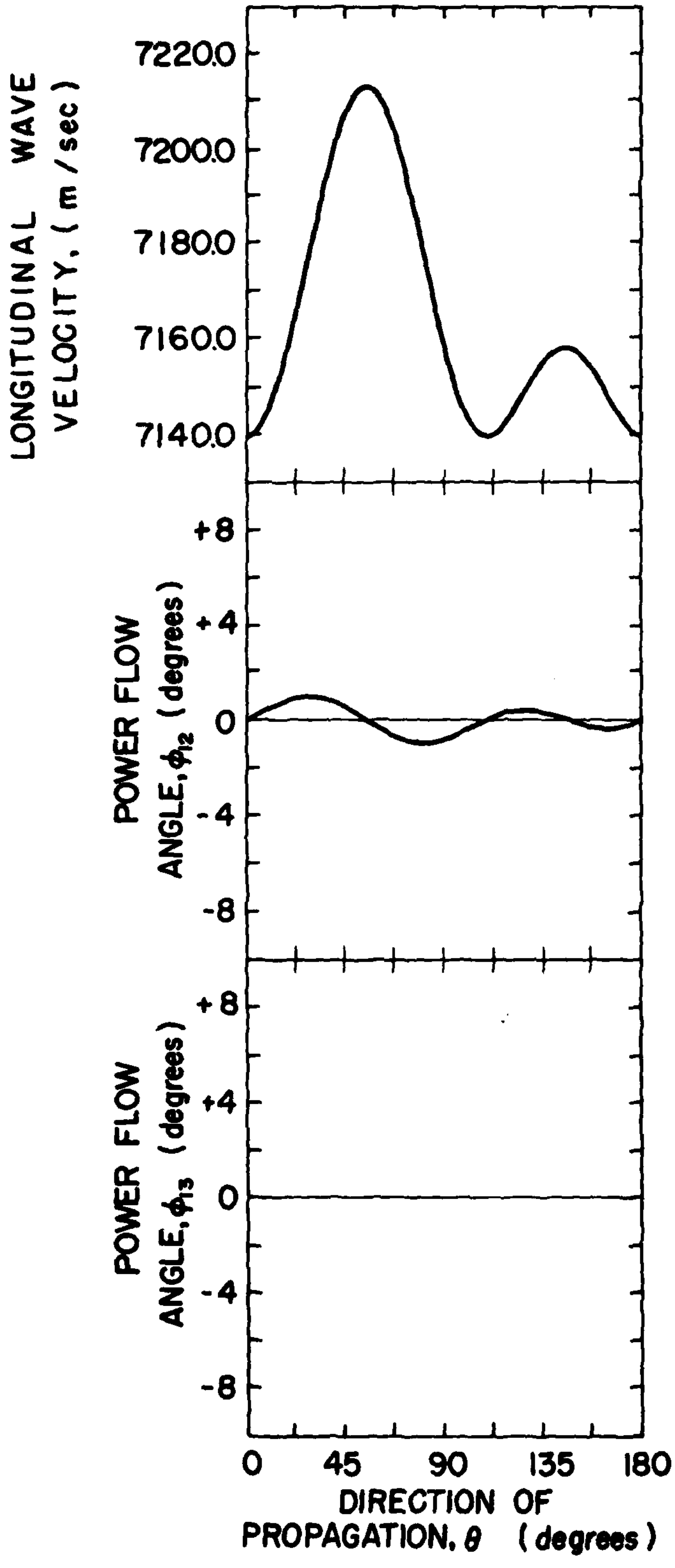
Z-PLANE
YIG


LONGITUDINAL WAVE VELOCITY, (m / sec)
7158.36
7158.28
7158.20
7158.12
7158.04
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
YIG

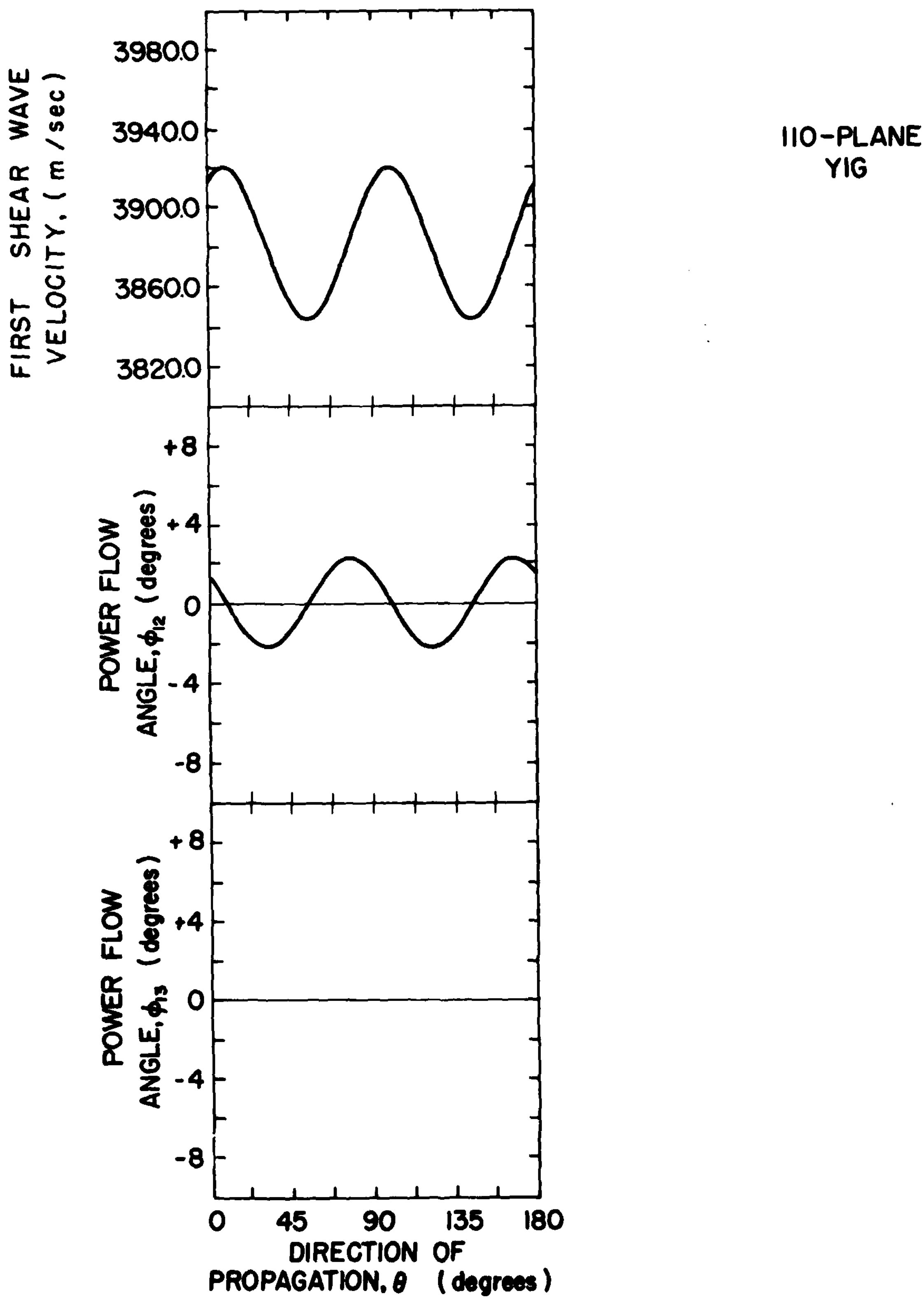


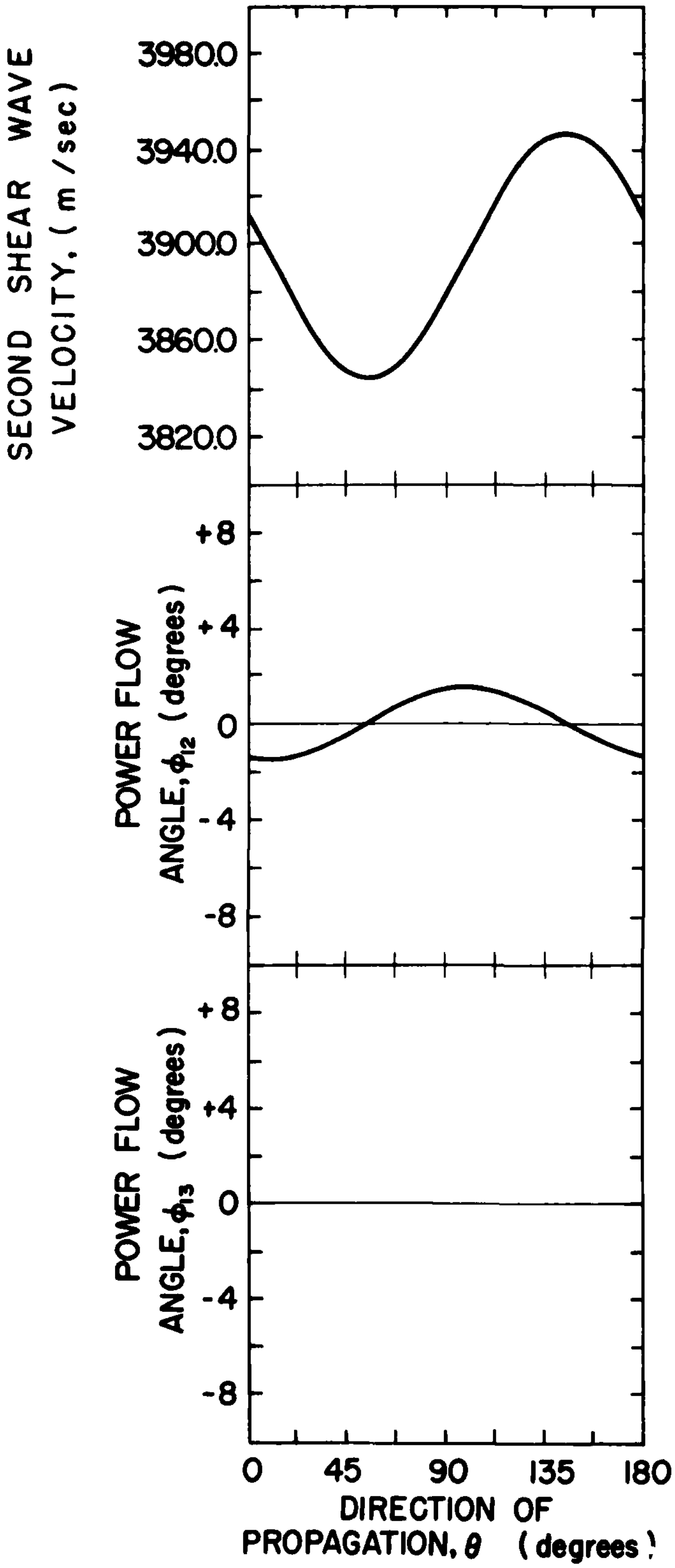
111-PLANE
YIG


SECOND SHEAR WAVE VELOCITY, (m /sec)
3876.0
3868.0
3860.0
3852.0
3844.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)
111-PLANE
YIG

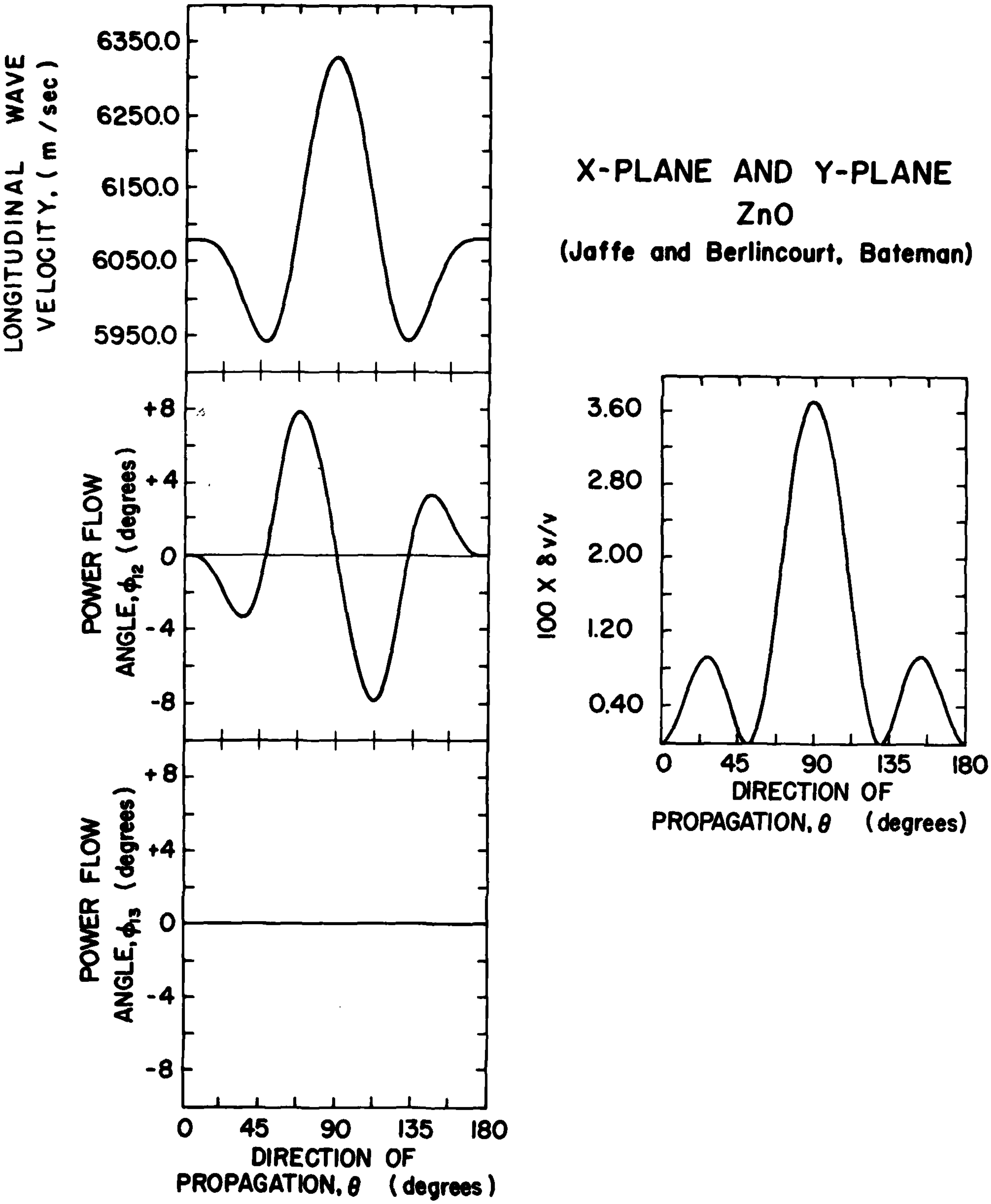


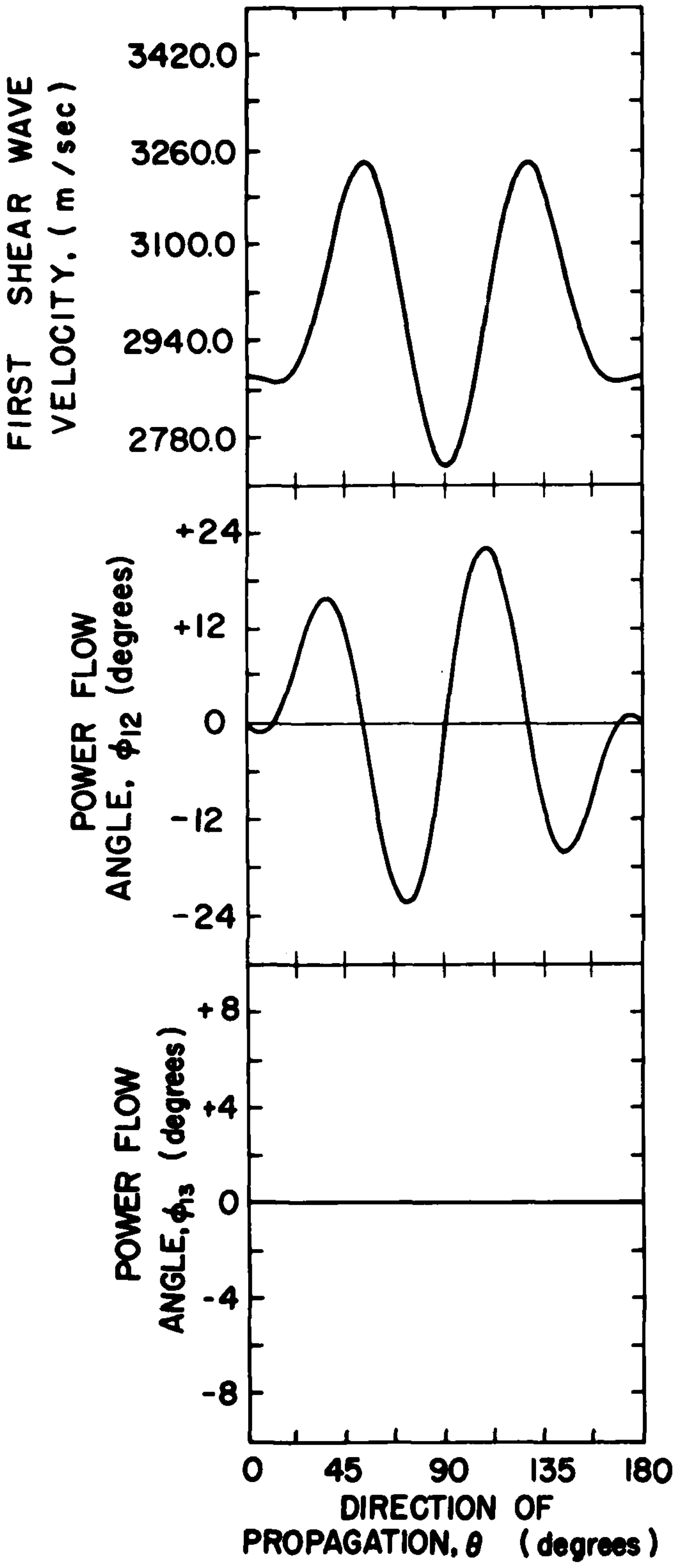
110-PLANE
YIG


110-PLANE
YIG
FIRST SHEAR WAVE VELOCITY, (m/sec)
3980.0
3940.0
3900.0
3860.0
3820.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0
45
90
135
180
DIRECTION OF PROPAGATION, θ (degrees)

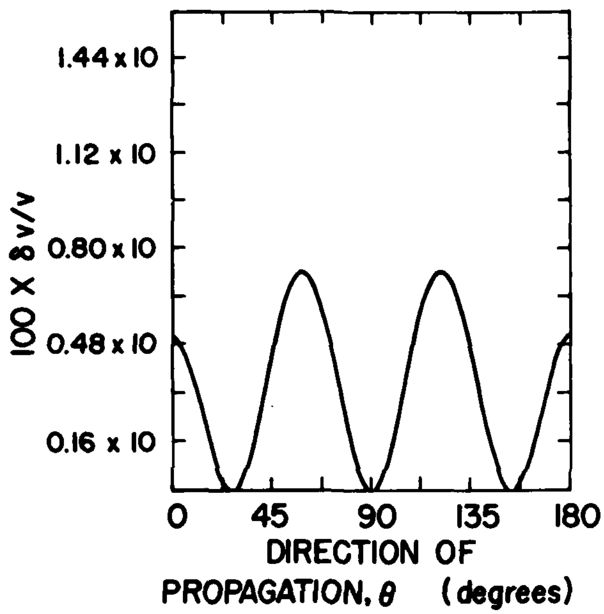


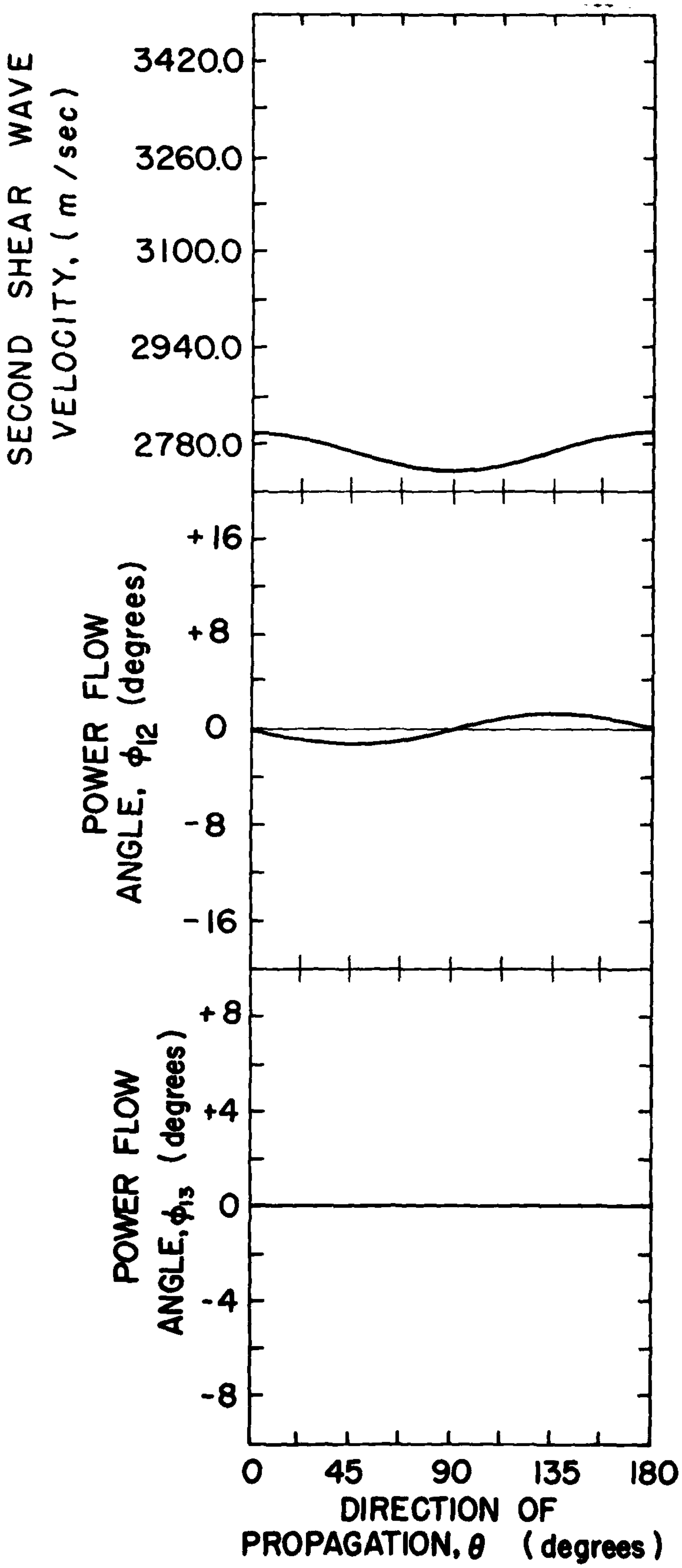
110-PLANE
YIG


X-PLANE AND Y-PLANE
ZnO
(Jaffe and Berlincourt, Bateman)
LONGITUDINAL WAVE VELOCITY, (m / sec)
6350.0
6250.0
6150.0
6050.0
5950.0
POWER FLOW ANGLE, ϕ_{12} (degrees)
+8
+4
0
-4
-8
POWER FLOW ANGLE, ϕ_{13} (degrees)
+8
+4
0
-4
-8
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)
100 X $\delta v/v$
3.60
2.80
2.00
1.20
0.40
0 45 90 135 180
DIRECTION OF PROPAGATION, θ (degrees)



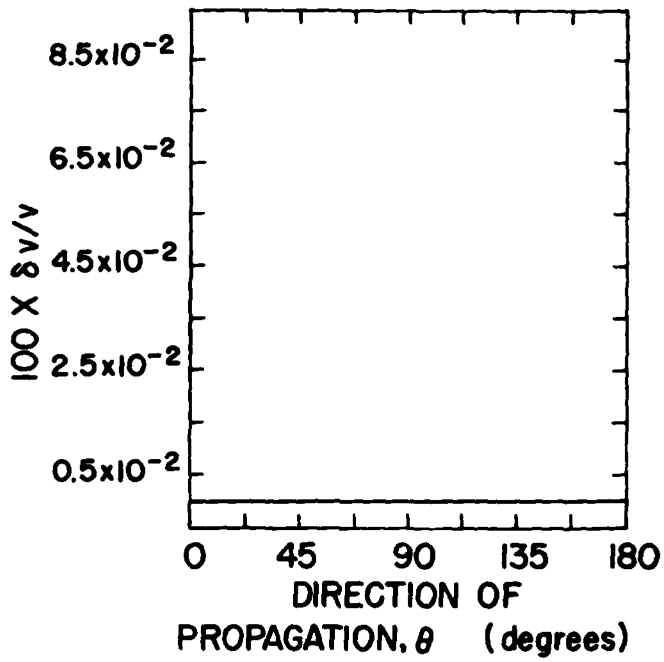
X-PLANE AND Y-PLANE
ZnO
(Jaffe and Berlincourt, Bateman)





X-PLANE AND Y-PLANE
ZnO

(Jaffe and Berlincourt, Bateman)



4. NUMERICAL DATA

Detailed numerical data have been calculated for various crystalline orientations of interest, for example, those having zero power flow angles (pure mode axes). Lambda, mu, and theta are the Euler angles defining the exact crystalline orientation under study (see Figure 1) and all other parameters have previously been defined in Sections 2 and 3. The quantities printed out are, of course, those divided by the angular frequency ω (in the case of S_{ij}, T_{ij}, E_i and D_i) or ω^2 (in the case of P_i) as indicated in Section 2. For the method of normalization of the β's prior to the calculation of the parameters given in this section the reader is referred to Slobodnik and O'Brien.[3] Finally, the quantities T_{ij}, S_{kj}, u_i, ϕ, E_i, and D_i are all divided by the square root of the magnitude of P_1 with their phases ultimately determined by the signs of the β's. This yields the so-called normalized components which are printed out in this section.

For materials and orientations having degenerate shear waves (identical characteristics except for polarization) only a single shear wave data sheet is included.

SINGLE CRYSTAL ALUMINUM

REGULAR CONSTANTS

LAMBDA	=	0.0000
MU	=	0.0000
THETA	=	0.0000

LONGITUDINAL VELOCITY		=	.6353768E+04	
INVERSE OF VELOCITY		=	.1573869E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.8577597E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.5857504E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.3385530E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3385530E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.5373857E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.3414424E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

SINGLE CRYSTAL ALUMINUM

LAMBDA = 0.0060
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.3220306E+04	
INVERSE OF VELOCITY		=	.3105295E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.4347413E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.4170030E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0	90.000
COMPONENTS	S13	=	.7446593E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.4796059E-03	0.000
(MAG, PHASE)				

ISOTROPIC ALUMINUM

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
LONGITUDINAL VELOCITY		=	.6420453E+04	
INVERSE OF VELOCITY		=	.1557522E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.8667612E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.5888162E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3126598E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3126598E+04	-90.000
NORMALIZED	S11	=	.5290352E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3396646E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

ISOTROPIC ALUMINUM

```
LAMBDA =    0.0000                                               REGULAR CONSTANTS
MU     =    0.0000
THETA  =    0.0000

  SHEAR WAVE VELOCITY                            =     .3109126E+04
INVERSE OF VELOCITY                              =     .3216339E-03

DELTA V/V                                        =     0.

POWER FLOW                  PHI 12               =     0.000
ANGLES                      PHI 13               =     0.000

COMPLEX POWER               P1                   =      .4197321E+07    0.
FLOW (RE IM)                P2                   =     0.               0.
                            P3                   =     0.               0.

NORMALIZED                  T11                  =     0.              90.000
STRESS                      T12                  =     0.              90.000
COMPONENTS                  T13                  =      .4097473E+04  -90.000
(MAG, PHASE)                T22                  =     0.              90.000
                            T23                  =     0.              90.000
                            T33                  =     0.              90.000

NORMALIZED                  S11                  =     0.              90.000
STRAIN                      S12                  =     0.              90.000
COMPONENTS                  S13                  =      .7849565E-07  -90.000
(MAG, PHASE)                S22                  =     0.              90.000
                            S23                  =     0.              90.000
                            S33                  =     0.              90.000

NORMALIZED                  U1                   =     0.               0.000
MECHANICAL                  U2                   =     0.               0.000
DISPLACEMENT                U3                   =      .4881058E-03    0.000
(MAG, PHASE)
```

POLYCRYSTALLINE ALUMINUM

LAMBDA =	0.0000			REGULAR CONSTANTS	
MU =	0.0000				
THETA =	0.0000				
LONGITUDINAL VELOCITY			=	.6411795E+04	
INVERSE OF VELOCITY			=	.1559626E-03	
DELTA V/V			=	0.	
POWER FLOW		PHI 12	=	0.000	
ANGLES		PHI 13	=	0.000	
COMPLEX POWER		P1	=	.8655923E+07	0.
FLOW (RE IM)		P2	=	0.	0.
		P3	=	0.	0.
NORMALIZED		T11	=	.5884190E+04	-90.000
STRESS		T12	=	0.	90.000
COMPONENTS		T13	=	0.	90.000
(MAG, PHASE)		T22	=	.3105898E+04	-90.000
		T23	=	0.	90.000
		T33	=	.3105898E+04	-90.000
NORMALIZED		S11	=	.5301072E-07	-90.000
STRAIN		S12	=	0.	90.000
COMPONENTS		S13	=	0.	90.000
(MAG, PHASE)		S22	=	0.	90.000
		S23	=	0.	90.000
		S33	=	0.	90.000
NORMALIZED		U1	=	.3398939E-03	0.000
MECHANICAL		U2	=	0.	0.000
DISPLACEMENT		U3	=	0.	0.000
(MAG, PHASE)					

POLYCRYSTALLINE ALUMINUM

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
SHEAR WAVE VELOCITY		=	.3115077E+04		
INVERSE OF VELOCITY		=	.3210194E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.4205354E+07	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.		90.000
STRESS	T12	=	0.		90.000
COMPONENTS	T13	=	.4101392E+04		-90.000
(MAG, PHASE)	T22	=	0.		90.000
	T23	=	0.		90.000
	T33	=	0.		90.000
NORMALIZED	S11	=	0.		90.000
STRAIN	S12	=	0.		90.000
COMPONENTS	S13	=	.7827084E-07		-90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	0.		0.000
MECHANICAL	U2	=	0.		0.000
DISPLACEMENT	U3	=	.4876393E-03		0.000
(MAG, PHASE)					

BARIUM SODIUM NIOBATE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.6826695E+04	
INVERSE OF VELOCITY		=	.1464838E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-.000	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1809074E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.8506643E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.1790872E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3581744E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.3443985E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2351104E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	.1033195E-07	90.000
	D3	=	0.	90.000

BARIUM SODIUM NIOBATE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3786769E+04	
INVERSE OF VELOCITY		=	.2640773E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	.000	
	PHI 13	=	-.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1003494E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.6335594E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.4168154E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3156768E-03	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	.1772110E-36	90.000
	D3	=	0.	90.000

BARIUM SODIUM NIOBATE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3653668E+04	
INVERSE OF VELOCITY		=	.2736975E-03	
DELTA V/V		=	.4151E+01	
POWER FLOW ANGLES	PHI 12	=	.000	
	PHI 13	=	-.000	
COMPLEX POWER FLOW (RE IM)	P1	=	3383836E-11	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.6223253E+04	-90.000
	T13	=	0.	90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.4397982E-07	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.3213753E-03	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	.5436199E+06	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	.1487874E+03	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	.1405225E-19	-90.000
	D2	=	0.	90.000
	D3	=	0.	90.000

BARIUM SODIUM NIOBATE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.5158836E+04	
INVERSE OF VELOCITY		=	.1623683E-03	
DELTA V/V		=	.1805E+02	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.6920281E-13	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8079831E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1904767E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1762663E+04	-90.000
NORMALIZED	S11	=	.4019102E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2475299E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.3801353E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.6172193E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.1535354E-20	-90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

BARIUM SODIUM NIOBATE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3528857E+04	
INVERSE OF VELOCITY		=	.2833779E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.9351470E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6116035E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4633360E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3270093E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.2594681E-06	-90.000

BARIUM SODIUM NIOBATE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3502021E+04	
INVERSE OF VELOCITY		=	.2855494E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.9280356E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6092735E+04	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.4686719E-07	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3282595E-03	180.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PH	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.3186963E-05	90.000
(MAG, PHASE)	D3	=	0.	90.000

BARIUM SODIUM NIOBATE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.6715232E+04	
INVERSE OF VELOCITY		=	.1489152E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1779536E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.8436910E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.3671292E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1765044E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.3530088E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2370536E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	.1412035E-07	90.000

BARIUM SODIUM NIOBATE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3786769E+04	
INVERSE OF VELOCITY		=	.2640773E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1003494E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.6335534E+04	-90.000
	T13	=	0.	90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.4168154E-07	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.3156768E-03	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	0.	90.000

BARIUM SODIUM NIOBATE

LAMBDA = 0.0000				REGULAR CONSTANTS	
MU = 0.0000					
THETA = 0.0000					
SECOND SHEAR WAVE VELOCITY		=	.3634219E+04		
INVERSE OF VELOCITY		=	.2751623E-03		
DELTA V/V		=	.2899E+01		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.4719033E-11	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.	90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	.6206667E+04	-90.000	
(MAG, PHASE)	T22	=	0.	90.000	
	T23	=	0.	90.000	
	T33	=	0.	90.000	
NORMALIZED	S11	=	0.	90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	.4433334E-07	-90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	0.	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	.3222341E-03	0.000	
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	.4603345E+06	0.000	
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	.1266667E+03	90.000	
FIELD (MAG, PHASE)	E2	=	0.	90.000	
	E3	=	0.	90.000	
NORMALIZED ELECTRIC	D1	=	.1487421E-20	90.000	
DISPLACEMENT	D2	=	0.	90.000	
(MAG, PHASE)	D3	=	0.	90.000	

BISMUTH GERMANIUM OXIDE (SLOBODNIK AND SETHARES)

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.3730019E+04	
INVERSE OF VELOCITY		=	.2680951E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1715809E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8284465E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1974033E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1974033E+04	-90.000
NORMALIZED	S11	=	.6472238E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2414157E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

BISMUTH GERMANIUM OXIDE (SLOBODNIK AND SETHARES)

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.1664854E+04	
INVERSE OF VELOCITY		=	.6006532E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.7658329E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5534737E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.1085243E-06	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3613541E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PH	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.2148780E-06	-90.000
(MAG, PHASE)	D3	=	0.	90.000

BISMUTH GERMANIUM OXIDE (SLOBODNIK AND SETHARES)

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.3374295E+04	
INVERSE OF VELOCITY		=	.2963582E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1552176E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7879533E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.4043197E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2294279E+04	-90.000
NORMALIZED	S11	=	.7522227E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2538222E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.7447005E-07	-90.000

BISMUTH GERMANIUM OXIDE (SLOBODNIK AND SETHARES)

LAMBDA = 45.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
FIRST SHEAR WAVE VELOCITY		=	.2301937E+04		
INVERSE OF VELOCITY		=	.4344168E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.1058891E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.	90.000	
STRESS	T12	=	.6508121E+04	-90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	0.	90.000	
	T23	=	0.	90.000	
	T33	=	0.	90.000	
NORMALIZED	S11	=	0.	90.000	
STRAIN	S12	=	.6674996E-07	-90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	0.	0.000	
MECHANICAL	U2	=	.3073084E-03	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	0.	0.000	
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	0.	90.000	
FIELD (MAG, PHASE)	E2	=	0.	90.000	
	E3	=	0.	90.000	
NORMALIZED ELECTRIC	D1	=	0.	90.000	
DISPLACEMENT	D2	=	0.	90.000	
(MAG, PHASE)	D3	=	.1000893E-34	-90.000	

BISMUTH GERMANIUM OXIDE (SLOBODNIK AND SETHARES)

LAMBDA = 45.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
SECOND SHEAR WAVE VELOCITY		=	.1755915E+04	
INVERSE OF VELOCITY		=	.5695036E-03	
DELTA V/V		=	.5186E+01	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9639249E-12	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5684085E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.1001926E-06	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3518595E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.1018541E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.5800626E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.2327147E-20	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

BISMUTH GERMANIUM OXIDE (SLOBODNIK AND SETHARES)

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.3310409E+04	
INVERSE OF VELOCITY		=	.3020774E-03	
DELTA V/V		=	.1913E+01	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1362958E-11	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7804584E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3412962E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3412993E+04	-90.000
NORMALIZED	S11	=	.7741026E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2562597E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.8565618E+06	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.2587480E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.1321213E-11	-90.000
(MAG, PHASE)	D3	=	0.	90.000

BISMUTH GERMANIUM OXIDE (SLOBODNIK AND SETHARES)

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.2111051E+04	
INVERSE OF VELOCITY		=	.4736976E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-14.966	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.9710836E+07	0.
FLOW (RE IM)	P2	=	-.2595887E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6232443E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.1666048E+04	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.7600513E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3209015E-03	180.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.8688469E-07	-90.000

BISMUTH GERMANIUM OXIDE (SLOBODNIK AND SETHARES)

LAMBDA = 45.0000 REGULAR CONSTANTS
MU = 90.0000
THETA = 35.2640

SECOND SHEAR WAVE VELOCITY		=	.2111044E+04	
INVERSE OF VELOCITY		=	.4736993E-03	
DELTA V/V		=	.1316E-08	
POWER FLOW	PHI 12	=	14.967	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.9710801E+07	0.
FLOW (RE IM)	P2	=	.2596024E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6232432E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1666115E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1666031E+04	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.7600554E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3209020E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.8538684E-07	90.000
(MAG, PHASE)	D3	=	0.	90.000

CADMIUM SULPHIDE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.4337906E+04	
INVERSE OF VELOCITY		=	.2305260E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.1045435E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.6466638E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3636147E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4142356E+04	-90.000
NORMALIZED	S11	=	.7129701E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3092797E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.1739647E-07	90.000
(MAG, PHASE)	D3	=	0.	90.000

CADMIUM SULPHIDE

LAMBDA = 90.0000 REGULAR CONSTANTS
MU = 90.0000
THETA = 0.0000

FIRST SHEAR WAVE VELOCITY		=	.1838952E+04	
INVERSE OF VELOCITY		=	.5437881E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.4431873E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.4210403E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.1291535E-06	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.4750139E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

CADMIUM SULPHIDE

```
LAMBDA =    90.0000                                              REGULAR CONSTANTS
MU     =    90.0000
THETA  =     0.0000

SECOND SHEAR WAVE VELOCITY                          =    .1796298E+04
INVERSE OF VELOCITY                                 =    .5567005E-03

DELTA V/V                                           =     .1793E+01

POWER FLOW                          PHI 12          =    0.000
ANGLES                              PHI 13          =    0.000

COMPLEX POWER                       P1              =     .6251189E-12     0.
FLOW (RE IM)                        P2              =    0.                0.
                                    P3              =    0.                0.

NORMALIZED                          T11             =    0.               90.000
STRESS                              T12             =     .4161298E+04    90.000
COMPONENTS                          T13             =    0.               90.000
(MAG, PHASE)                        T22             =    0.               90.000
                                    T23             =    0.               90.000
                                    T33             =    0.               90.000

NORMALIZED                          S11             =    0.               90.000
STRAIN                              S12             =     .1337808E-05    90.000
COMPONENTS                          S13             =    0.               90.000
(MAG, PHASE)                        S22             =    0.               90.000
                                    S23             =    0.               90.000
                                    S33             =    0.               90.000

NORMALIZED                          U1              =    0.                0.000
MECHANICAL                          U2              =     .4806205E-03   180.000
DISPLACEMENT                        U3              =    0.                0.000
(MAG, PHASE)

ELECTRIC POTENTIAL                  PHI             =     .1264791E+07     0.000
(MAG, PHASE)

NORMALIZED ELECTRIC                 E1              =     .7041096E+03    90.000
FIELD (MAG, PHASE)                  E2              =    0.               90.000
                                    E3              =    0.               90.000

NORMALIZED ELECTRIC                 D1              =     .4342182E-20   -90.000
DISPLACEMENT                        D2              =    0.               90.000
(MAG, PHASE)                        D3              =    0.               90.000
```

CADMIUM SULPHIDE

LAMBDA = 90.0000				REGULAR CONSTANTS	
MU = 90.0000					
THETA = 90.0000					
LONGITUDINAL VELOCITY		=	.4465092E+04		
INVERSE OF VELOCITY		=	.2239596E-03		
DELTA V/V		=	.1202E+01		
POWER FLOW	PHI 12	=	.000		
ANGLES	PHI 13	=	.000		
COMPLEX POWER	P1	=	.3950001E-12	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.6560753E+04	-90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.3394950E+04	-90.000	
	T23	=	0.	90.000	
	T33	=	.3394950E+04	-90.000	
NORMALIZED	S11	=	.6827251E-07	-90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.3048430E-03	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	.1591114E+07	0.000	
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	.3563453E+03	90.000	
FIELD (MAG, PHASE)	E2	=	0.	90.000	
	E3	=	0.	90.000	
NORMALIZED ELECTRIC	D1	=	.3052569E-20	-90.000	
DISPLACEMENT	D2	=	0.	90.000	
(MAG, PHASE)	D3	=	0.	90.000	

CADMIUM SULPHIDE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.1764096E+04	
INVERSE OF VELOCITY		=	.5668627E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-.000	
	PHI 13	=	-.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.4251470E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.4123819E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.1374605E-06	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.4849874E-03	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	.5773346E-07	90.000

CADMIUM SULPHIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.4337906E+04	
INVERSE OF VELOCITY		=	.2305260E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1045435E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.6466638E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.4142356E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3636147E+04	-90.000
NORMALIZED	S11	=	.7129701E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3092797E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.1739647E-07	90.000

CADMIUM SULPHIDE

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

FIRST SHEAR WAVE VELOCITY		=	.1838952E+04	
INVERSE OF VELOCITY		=	.5437881E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW, (RE IM)	P1	=	.4431873E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.4210403E+04	-90.000
	T13	=	0.	90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.1291535E-06	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.4750139E-03	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	0.	90.000

CADMIUM SULPHIDE

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
SECOND SHEAR WAVE VELOCITY		=	.1796298E+04	
INVERSE OF VELOCITY		=	.5567005E-03	
DELTA V/V		=	.1793E+01	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6251189E-12	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.4161288E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.1337808E-05	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.4806205E-03	180.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.1264791E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.7041096E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.4342182E-20	-90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

SINGLE CRYSTAL CHROMIUM

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
LONGITUDINAL VELOCITY		=	.6920067E+04		
INVERSE OF VELOCITY		=	.1445073E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.2456624E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.9912868E+04	-90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.1720174E+04	-90.000	
	T23	=	0.	90.000	
	T33	=	.1720174E+04	-90.000	
NORMALIZED	S11	=	.2915549E-07	-90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.2017580E-03	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					

SINGLE CRYSTAL CHROMIUM

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.3734121E+04	
INVERSE OF VELOCITY		=	.2678006E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1325613E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.7281734E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.3677674E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2746576E-03	0.000
(MAG, PHASE)				

POLYCRYSTALLINE CHROMIUM

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.5650214E+04	
INVERSE OF VELOCITY		=	.1503711E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.2360826E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.9717667E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.2581371E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2581371E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.3094798E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2058107E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

POLYCRYSTALLINE CHROMIUM

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
SHEAR WAVE VELOCITY		=	.4029818E+04		
INVERSE OF VELOCITY		=	.2481501E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.1430586E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.	90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	.7564616E+04	-90.000	
(MAG, PHASE)	T22	=	0.	90.000	
	T23	=	0.	90.000	
	T33	=	0.	90.000	
NORMALIZED	S11	=	0.	90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	.3280406E-07	-90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	0.	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	.2643888E-03	0.000	
(MAG, PHASE)					

SINGLE CRYSTAL COPPER

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.4342995E+04	
INVERSE OF VELOCITY		=	.2302558E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1945662E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.8821931E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.6368495E+04	-90.000
	T23	=	0.	90.000
	T33	=	.6368495E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.5220078E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2267077E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

SINGLE CRYSTAL COPPER

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.2900893E+04	
INVERSE OF VELOCITY		=	.3447215E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1299600E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.7209993E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4781162E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2773928E-03	0.000
(MAG, PHASE)				

ISOTROPIC COPPER

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
LONGITUDINAL VELOCITY		=	.4848140E+04	
INVERSE OF VELOCITY		=	.2062647E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2171967E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9320873E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.4771083E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4771083E+04	-90.000
NORMALIZED	S11	=	.4425866E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2145722E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

ISOTROPIC COPPER

```
LAMBDA =     0.0000                                                  REGULAR CONSTANTS
MU     =     0.0000
THETA  =     0.0000

  SHEAR WAVE VELOCITY                                   =    .2395122E+04
INVERSE OF VELOCITY                                     =    .4175153E-03

DELTA V/V                                               =    0.

POWER FLOW                           PHI 12             =    0.000
ANGLES                               PHI 13             =    0.000

COMPLEX POWER                        P1                 =     .1073014E+08      0.
FLOW (RE IM)                         P2                 =    0.                 0.
                                     P3                 =    0.                 0.

NORMALIZED                           T11                =    0.                 90.000
STRESS                               T12                =    0.                 90.000
COMPONENTS                           T13                =     .6551380E+04     -90.000
(MAG, PHASE)                         T22                =    0.                 90.000
                                     T23                =    0.                 90.000
                                     T33                =    0.                 90.000

NORMALIZED                           S11                =    0.                 90.000
STRAIN                               S12                =    0.                 90.000
COMPONENTS                           S13                =     .6372938E-07     -90.000
(MAG, PHASE)                         S22                =    0.                 90.000
                                     S23                =    0.                 90.000
                                     S33                =    0.                 90.000

NORMALIZED                           U1                 =    0.                  0.000
MECHANICAL                           U2                 =    0.                  0.000
DISPLACEMENT                         U3                 =     .3052792E-03       0.000
(MAG, PHASE)
```

POLYCRYSTALLINE COPPER

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.4752819E+04	
INVERSE OF VELOCITY		=	.2104015E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.2129263E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.9228787E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.4824139E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4824139E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.4559677E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2167132E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

POLYCRYSTALLINE COPPER

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.2321772E+04	
INVERSE OF VELOCITY		=	.4307055E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1040154E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.6450283E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.6677312E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3100639E-03	0.000

DIAMOND

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
LONGITUDINAL VELOCITY		=	.1750366E+05	
INVERSE OF VELOCITY		=	.5713091E-04	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.3073643E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.1108803E+05	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1288114E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1288114E+04	-90.000
NORMALIZED	S11	=	.1030492E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.1803737E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

DIAMOND

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.1280438E+05	
INVERSE OF VELOCITY		=	.7809827E-04	
DELTA V/V		=	0.	
POWER FLOW	PH 12	=	0.000	
ANGLES	PH 13	=	0.000	
COMPLEX POWER	P1	=	.2248449E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.9483563E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.8235119E-08	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2108912E-03	0.000
(MAG, PHASE)				

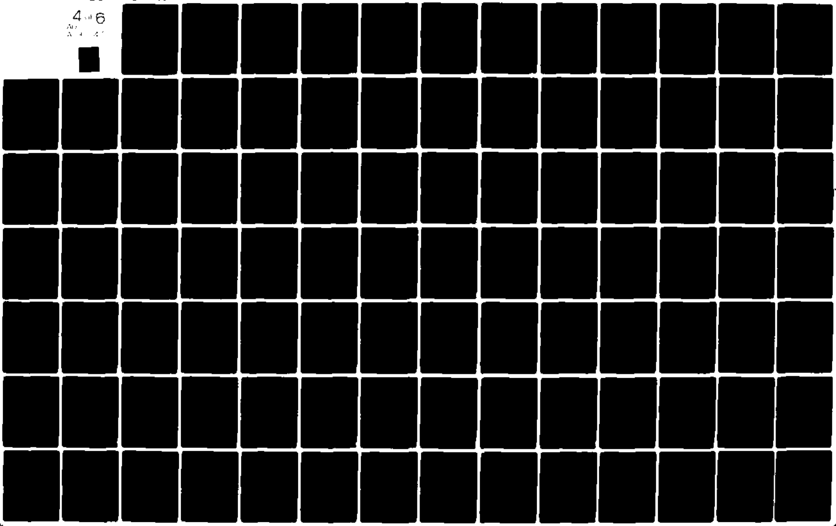
DIAMOND

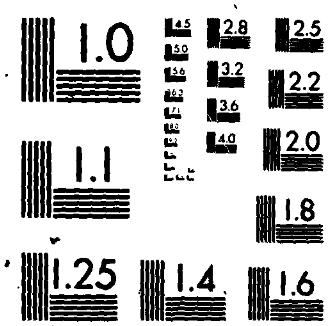
LAMBDA = 45.0000 REGULAR CONSTANTS
MU = 0.0000
THETA = 0.0000

LONGITUDINAL WAVE VELOCITY		=	.1830129E+05	
INVERSE OF VELOCITY		=	.5464095E-04	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.3213707E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.1133791E+05	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2380740E+03	-90.000
	T23	=	0.	90.000
	T33	=	.1204828E+04	-90.000
NORMALIZED	S11	=	.9638624E-08	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.1763993E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

AD-A090 947 ROME AIR DEVELOPMENT CENTER GRIFFISS AFB NY F/G 20/1
MICROWAVE ACOUSTICS HANDBOOK. VOLUME 3. BULK WAVE VELOCITIES.(U)
MAY 80 A J SLOBODNIK, R T DELMONICO
UNCLASSIFIED RADC-TR-80-188-VOL-3 NL

4 of 6





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

DIAMOND

LAMBDA = 45.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
FIRST SHEAR WAVE VELOCITY		=	.1280438E+05	
INVERSE OF VELOCITY		=	.7809827E-04	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2248449E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.9483563E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.8235119E-08	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2108912E-03	0.000
(MAG, PHASE)				

DIAMOND

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.1163585E+05	
INVERSE OF VELOCITY		=	.8594131E-04	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2043255E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.9040475E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.9506283E-08	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2212273E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

DIAMOND

LAMBDA = 45.0000

MU = 90.0000

THETA = 35.2640

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.1855956E+05	
INVERSE OF VELOCITY		=	.5388060E-04	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.3259058E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.1141763E+05	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.5486760E+03	-90.000
	T23	=	0.	90.000
	T33	=	.5486650E+03	-90.000
NORMALIZED	S11	=	.9438139E-08	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.1751677E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

DIAMOND

LAMBDA = 45.0000			REGULAR CONSTANTS	
MU = 90.0000				
THETA = 35.2640				
FIRST SHEAR WAVE VELOCITY		=	.1203796E+05	
INVERSE OF VELOCITY		=	.8307055E-04	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	5.308	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.2113866E+08	0.
FLOW (RE IM)	P2	=	.1963856E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.9195359E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.8542814E+03	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.9033964E-08	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2175010E-03	0.000
(MAG, PHASE)				

DIAMOND

LAMBDA = 45.0000				REGULAR CONSTANTS	
MU = 90.0000					
THETA = 35.2640					
SECOND SHEAR WAVE VELOCITY		=	.1203798E+05		
INVERSE OF VELOCITY		=	.8307044E-04		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	-5.308		
ANGLES	PHI 13	=	.000		
COMPLEX POWER	P1	=	.2113869E+08	0.	
FLOW (RE IM)	P2	=	-.1963922E+07	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.		90.000
STRESS	T12	=	.9195365E+04		-90.000
COMPONENTS	T13	=	0.		90.000
(MAG, PHASE)	T22	=	.8542976E+03		90.000
	T23	=	0.		90.000
	T33	=	.8542784E+03		-90.000
NORMALIZED	S11	=	0.		90.000
STRAIN	S12	=	.9033947E-08		-90.000
COMPONENTS	S13	=	0.		90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	0.		0.000
MECHANICAL	U2	=	.2175009E-03		0.000
DISPLACEMENT	U3	=	0.		0.000
(MAG, PHASE)					

EUROPIUM IRON GARNET

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.6322037E+04	
INVERSE OF VELOCITY		=	.1581769E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1985120E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8910936E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3798686E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3798686E+04	-90.000
NORMALIZED	S11	=	.3550174E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2244433E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

EUROPIUM IRON GARNET

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.3483354E+04	
INVERSE OF VELOCITY		=	.2870796E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1093773E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.6614449E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.4340189E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3023684E-03	0.000

EUROPIUM IRON GARNET

LAMBDA = 45.0000 REGULAR CONSTANTS
MU = 0.0000
THETA = 0.0000

LONGITUDINAL WAVE VELOCITY		=	.6374711E+04	
INVERSE OF VELOCITY		=	.1568699E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2001659E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8947981E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3604438E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3751701E+04	-90.000
NORMALIZED	S11	=	.3506262E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2235141E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

EUROPIUM IRON GARNET

LAMBDA = 45.0000 REGULAR CONSTANTS
MU = 0.0000
THETA = 0.0000

FIRST SHEAR WAVE VELOCITY		=	.3483354E+04	
INVERSE OF VELOCITY		=	.2870796E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1093773E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6614449E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4340189E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3023684E-03	0.000
(MAG, PHASE)				

```
EUROPIUM IRON GARNET

LAMBDA =    45.0000                                          REGULAR CONSTANTS
MU     =     0.0000
THETA  =     0.0000

SECOND SHEAR WAVE VELOCITY                       =    .3385996E+04
INVERSE OF VELOCITY                              =    .2953341E-03

DELTA V/V                                        =    0.

POWER FLOW                       PHI 12          =     .000
ANGLES                           PHI 13          =    0.000

COMPLEX POWER                    P1              =     .1063203E+08    0.
FLOW (RE IM)                     P2              =    0.               0.
                                 P3              =    0.               0.

NORMALIZED                       T11             =    0.              90.000
STRESS                           T12             =     .6521358E+04  -90.000
COMPONENTS                       T13             =    0.              90.000
(MAG, PHASE)                     T22             =    0.              90.000
                                 T23             =    0.              90.000
                                 T33             =    0.              90.000

NORMALIZED                       S11             =    0.              90.000
STRAIN                           S12             =     .4528721E-07  -90.000
COMPONENTS                       S13             =    0.              90.000
(MAG, PHASE)                     S22             =    0.              90.000
                                 S23             =    0.              90.000
                                 S33             =    0.              90.000

NORMALIZED                       U1              =    0.               0.000
MECHANICAL                       U2              =     .3066846E-03    0.000
DISPLACEMENT                     U3              =    0.               0.000
(MAG, PHASE)
```

```
EUROPIUM IRON GARNET

LAMBDA =   45.0000                                              REGULAR CONSTANTS
ML     =   90.0000
THETA  =   35.2640

LONGITUDINAL WAVE VELOCITY                        =    .6392173E+04
INVERSE OF VELOCITY                               =    .1564413E-03

DELTA V/V                                         =    0.

POWER FLOW                   PHI 12               =     .000
ANGLES                       PHI 13               =     .000

COMPLEX POWER                P1                   =     .2007142E+08     0.
FLOW (RE IM)                 P2                   =    0.                0.
                             P3                   =    0.                0.

NORMALIZED                   T11                  =     .8960223E+04  -90.000
STRESS                       T12                  =    0.              90.000
COMPONENTS                   T13                  =    0.              90.000
(MAG, PHASE)                 T22                  =     .3638566E+04  -90.000
                             T23                  =    0.              90.000
                             T33                  =     .3638564E+04  -90.000

NORMALIZED                   S11                  =     .3491905E-07  -90.000
STRAIN                       S12                  =    0.              90.000
COMPONENTS                   S13                  =    0.              90.000
(MAG, PHASE)                 S22                  =    0.              90.000
                             S23                  =    0.              90.000
                             S33                  =    0.              90.000

NORMALIZED                   U1                   =     .2232086E-03    0.000
MECHANICAL                   U2                   =    0.               0.000
DISPLACEMENT                 U3                   =    0.               0.000
(MAG, PHASE)
```

EUROPIUM IRON GARNET

LAMBDA = 45.0000 REGULAR CONSTANTS
MU = 90.0000
THETA = 35.2640

FIRST SHEAR WAVE VELOCITY		=	.3418757E+04	
INVERSE OF VELOCITY		=	.2925039E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-1.545	
	PHI 13	=	-.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1073490E+08	0.
	P2	=	-.2895683E+06	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.6552831E+04	-90.000
	T13	=	0.	90.000
	T22	=	.1767592E+03	90.000
	T23	=	0.	90.000
	T33	=	.1767558E+03	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.4463780E-07	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.3052116E-03	0.000
	U3	=	0.	0.000

EUROPIUM IRON GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3418756E+04	
INVERSE OF VELOCITY		=	.2925040E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	1.545	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1073489E+08	0.
FLOW (RE IM)	P2	=	.2895628E+06	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6552830E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.1767559E+03	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4463782E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3052117E-03	0.000
(MAG, PHASE)				

FUSED QUARTZ

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
LONGITUDINAL VELOCITY		=	.5973426E+04	
INVERSE OF VELOCITY		=	.1674081E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6570769E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.5126702E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1051464E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1051464E+04	-90.000
NORMALIZED	S11	=	.6530831E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3901143E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

FUSED QUARTZ

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
SHEAR WAVE VELOCITY		=	.3765875E+04		
INVERSE OF VELOCITY		=	.2655425E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.4142463E+07	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.		90.000
STRESS	T12	=	0.		90.000
COMPONENTS	T13	=	.4070608E+04		-90.000
(MAG, PHASE)	T22	=	0.		90.000
	T23	=	0.		90.000
	T33	=	0.		90.000
NORMALIZED	S11	=	0.		90.000
STRAIN	S12	=	0.		90.000
COMPONENTS	S13	=	.6523411E-07		-90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	0.		0.000
MECHANICAL	U2	=	0.		0.000
DISPLACEMENT	U3	=	.4913271E-03		0.000
(MAG, PHASE)					

GADOLINIUM GALLIUM GARNET

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

LONGITUDINAL VELOCITY		=	.6347249E+04	
INVERSE OF VELOCITY		=	.1575486E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.2251369E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.9489719E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.3818465E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3818466E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.3320406E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2107544E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

GADOLINIUM GALLIUM GARNET

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.3567782E+04	
INVERSE OF VELOCITY		=	.2802862E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1265492E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.7114751E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.3939508F-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.2811061E-03	0.000

GADOLINIUM GALLIUM GARNET

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.6401429E+04	
INVERSE OF VELOCITY		=	.1562151E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2270587E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9530135E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3609453E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3770091E+04	-90.000
NORMALIZED	S11	=	.3278340E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2098606E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

GADOLINIUM GALLIUM GARNET

LAMBDA = 45.0000				REGULAR CONSTANTS	
MU = 0.0000					
THETA = 0.0000					
FIRST SHEAR WAVE VELOCITY		=	.3567782E+04		
INVERSE OF VELOCITY		=	.2802862E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.1265492E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.	90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	.7114751E+04	-90.000	
(MAG, PHASE)	T22	=	0.	90.000	
	T23	=	0.	90.000	
	T33	=	0.	90.000	
NORMALIZED	S11	=	0.	90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	.3939508E-07	-90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	0.	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	.2811061E-03	0.000	
(MAG, PHASE)					

GADOLINIUM GALLIUM GARNET

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3469631E+04	
INVERSE OF VELOCITY		=	.2882151E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1230678E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.7016205E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.4107848E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2850544E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

GADOLINIUM GALLIUM GARNET

LAMBDA = 45.0000			REGULAR CONSTANTS	
MU = 90.0000				
THETA = 35.2640				
LONGITUDINAL WAVE VELOCITY		=	.6419387E+04	
INVERSE OF VELOCITY		=	.1557781E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	.000	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.2276957E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.9543493E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.3647640E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3647638E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.3264593E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2095669E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

GADOLINIUM GALLIUM GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3502653E+04	
INVERSE OF VELOCITY		=	.2854979E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	1.520	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1242391E+08	0.
FLOW (RE IM)	P2	=	.3297316E+06	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.7049514E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.1870947E+03	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4049894E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2837075E-03	0.000
(MAG, PHASE)				

GADOLINIUM GALLIUM GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3502654E+04	
INVERSE OF VELOCITY		=	.2854978E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-1.520	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1242392E+08	0.
FLOW (RE IM)	P2	=	-.3297378E+06	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.7049515E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1870982E+03	90.000
	T23	=	0.	90.000
	T33	=	.1870946E+03	-90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.4049892E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2837075E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

GALLIUM ARSENIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.4733978E+04	
INVERSE OF VELOCITY		=	.2112388E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1256871E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7090476E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3205610E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3205610E+04	-90.000
NORMALIZED	S11	=	.5958383E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2820685E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

GALLIUM ARSENIDE

LAMBDA = 0.0000
MU = 8.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.3347428E+04	
INVERSE OF VELOCITY		=	.2987368E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.8887421E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.5962356E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.5010383E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3354379E-03	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	.1603322E-07	90.000
	D3	=	0.	90.000

GALLIUM ARSENIDE

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.5241799E+04	
INVERSE OF VELOCITY		=	.1907742E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1391698E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7461093E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1375623E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2751246E+04	-90.000
NORMALIZED	S11	=	.5113840E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2680572E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.8182144E-08	90.000

GALLIUM ARSENIDE

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3354817E+04	
INVERSE OF VELOCITY		=	.2980789E-03	
DELTA V/V		=	.2203E+00	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.3297352E-11	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5968933E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4993839E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3350683E-03	180.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.5507029E+06	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.1641529E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.2359196E-20	-90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

GALLIUM ARSENIDE

LAMBDA = 45.0000			REGULAR CONSTANTS
MU = 0.0000			
THETA = 0.0000			

SECOND SHEAR WAVE VELOCITY		=	.2477773E+04	
INVERSE OF VELOCITY		=	.4035882E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6578488E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5129713E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.7867657E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3898854E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.1906633E-35	90.000

GALLIUM ARSENIDE

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.5406582E+04	
INVERSE OF VELOCITY		=	.1849597E-03	
DELTA V/V		=	.1130E+00	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.3985479E-11	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7577460E+04	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1742402E+04	90.000
	T23	=	0.	90.000
	T33	=	.1742388E+04	90.000
NORMALIZED	S11	=	.4881840E-07	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2639407E-03	180.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.5009100E+06	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.9264819E+02	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.1128165E-12	-90.000
(MAG, PHASE)	D3	=	0.	90.000

GALLIUM ARSENIDE

LAMBDA = 45.0000 REGULAR CONSTANTS
MU = 90.0000
THETA = 35.2640

FIRST SHEAR WAVE VELOCITY		=	.2797862E+04	
INVERSE OF VELOCITY		=	.3574158E-03	
DELTA V/V		=	.5512E-10	
POWER FLOW	PHI 12	=	-16.966	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.7428323E+07	0.
FLOW (RE IM)	P2	=	-.2266218E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5450990E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1662966E+04	90.000
	T23	=	0.	90.000
	T33	=	.1662914E+04	-90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.6556897E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3669059E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.1211412E-07	-90.000
(MAG, PHASE)	D3	=	0.	90.000

GALLIUM ARSENIDE

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.2797850E+04	
INVERSE OF VELOCITY		=	.3574173E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	16.965	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.7428292E+07	0.
	P2	=	.2266154E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.5450979E+04	90.000
	T22	=	0.	90.000
	T23	=	.1662934E+04	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.6556938E-07	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3669066E-03	180.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	.1211396E-07	90.000

GERMANIUM

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.4924238E+04	
INVERSE OF VELOCITY		=	.2030771E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1309847E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.7238353E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.2687733E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2687733E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.5611134E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2763056E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

GERMANIUM

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.3548800E+04	
INVERSE OF VELOCITY		=	.2817854E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.9439809E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.6144855E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.4585712E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3254756E-03	0.000

GERMANIUM

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

R=GULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.5405546E+04	
INVERSE OF VELOCITY		=	.1849952E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1437875E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7583865E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1046471E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2336874E+04	-90.000
NORMALIZED	S11	=	.4878652E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2637178E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

GERMANIUM

LAMBDA = 45.0000			REGULAR CONSTANTS
MU = 0.0000			
THETA = 0.0000			

FIRST SHEAR WAVE VELOCITY		=	.3548800E+04	
INVERSE OF VELOCITY		=	.2817854E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9439809E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6144855E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4585712E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3254756E-03	0.000
(MAG, PHASE)				

GERMANIUM

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.2760830E+04	
INVERSE OF VELOCITY		=	.3622100E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.7343807E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5419892E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.6682974E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3690111E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

GERMANIUM

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.5556725E+04	
INVERSE OF VELOCITY		=	.1799621E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	.000	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1478089E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.7689184E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.1416764E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1416750E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.4680916E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2601056E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

GERMANIUM

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3046214E+04	
INVERSE OF VELOCITY		=	.3282764E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	14.175	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.8102928E+07	0.
FLOW (RE IM)	P2	=	.2046572E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5693128E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.1437924E+04	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.5766186E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3513007E-03	180.000
(MAG, PHASE)				

GERMANIUM

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3046224E+04	
INVERSE OF VELOCITY		=	.3282753E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-14.175	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.8102956E+07	0.
FLOW (RE IM)	P2	=	-.2046631E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5693135E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1437952E+04	90.000
	T23	=	0.	90.000
	T33	=	.1437910E+04	-90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.5766157E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3513001E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SINGLE CRYSTAL GOLD

LAMBDA = 0.0000

MU = 0.0000

THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.3129336E+04	
INVERSE OF VELOCITY		=	.3195566E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.3019810E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.1099056E+05	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.9246026E+04	-90.000
	T23	=	0.	90.000
	T33	=	.9246026E+04	-90.000
NORMALIZED	S11	=	.5815111E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.1819744E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SINGLE CRYSTAL GOLD

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.1485683E+04	
INVERSE OF VELOCITY		=	.6730911E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1433684E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.7572804E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.8888268E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2641030E-03	0.000
(MAG, PHASE)				

ISOTROPIC GOLD

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

LONGITUDINAL VELOCITY		=	.3377763E+04	
INVERSE OF VELOCITY		=	.2960534E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.3259548E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.1141849E+05	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.8317555E+04	-90.000
	T23	=	0.	90.000
	T33	=	.8317555E+04	-90.000
NORMALIZED	S11	=	.5185508E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.1751545E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

ISOTROPIC GOLD

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

SHEAR WAVE VELOCITY		=	.1244678E+04	
INVERSE OF VELOCITY		=	.8034208E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1201114E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6931419E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.1159100E-06	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2885412E-03	0.000
(MAG, PHASE)				

INDIUM ANTIMONIDE

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

LONGITUDINAL VELOCITY		=	.3412689E+04	
INVERSE OF VELOCITY		=	.2930241E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9845608E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.6275542E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3427268E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3427268E+04	-90.000
NORMALIZED	S11	=	.9338605E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3186976E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

INDIUM ANTIMONIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.2287787E+04	
INVERSE OF VELOCITY		=	.4371037E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6600265E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5138196E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.8506947E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3892417E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.1207987E-07	90.000
(MAG, PHASE)	D3	=	0.	90.000

INDIUM ANTIMONIDE

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.3773253E+04	
INVERSE OF VELOCITY		=	.2650233E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1088583E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.6598737E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1747079E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2947945E+04	-90.000
NORMALIZED	S11	=	.8032547E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3030883E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.5703108E-08	90.000

INDIUM ANTIMONIDE

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.2289136E+04	
INVERSE OF VELOCITY		=	.4368461E-03	
DELTA V/V		=	.5893E-01	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2623092E-10	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5139711E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.8499429E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3891269E-03	180.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.1952510E+06	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.8529462E+02	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.1829037E-19	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

INDIUM ANTIMONIDE

LAMBDA = 45.0000

MU = 0.0000

THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.1625725E+04	
INVERSE OF VELOCITY		=	.6151103E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.4690216E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.4331381E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.1420125E-06	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.4617465E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.1527167E-35	90.000

INDIUM ANTIMONIDE

REGULAR CONSTANTS

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

LONGITUDINAL WAVE VELOCITY		=	.3887072E+04	
INVERSE OF VELOCITY		=	.2572630E-03	
DELTA V/V		=	.2725E-01	
POWER FLOW ANGLES	PHI 12	=	.000	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.3340611E-10	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.6697523E+04	90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.2051926E+04	90.000
	T23	=	0.	90.000
	T33	=	.2051913E+04	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.7682334E-07	90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2986179E-03	180.000
	U2	=	0.	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	.1730163E+06	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	.4451070E+02	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	.7926477E-13	-90.000
	D3	=	0.	90.000

INDIUM ANTIMONIDE

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.1872608E+04	
INVERSE OF VELOCITY		=	.5340146E-03	
DELTA V/V		=	.1572E-10	
POWER FLOW	PHI 12	=	-19.204	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.5402474E+07	0.
FLOW (RE IM)	P2	=	-.1881786E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.4648644E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1619203E+04	90.000
	T23	=	0.	90.000
	T33	=	.1619147E+04	-90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.1148753E-06	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.4302330E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.9418001E-08	-90.000
(MAG, PHASE)	D3	=	0.	90.000

INDIUM ANTIMONIDE

REGULAR CONSTANTS

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

SECOND SHEAR WAVE VELOCITY		=	.1872599E+04	
INVERSE OF VELOCITY		=	.5340172E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	19.204	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.5402448E+07	0.
	P2	=	.1881733E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.4648633E+04	90.000
	T22	=	0.	90.000
	T23	=	.1619171E+04	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.1148762E-06	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.4302340E-03	180.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	.9417887E-08	90.000

INDIUM ARSENIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.3822601E+04	
INVERSE OF VELOCITY		=	.2616020E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1089441E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.6601337E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3587184E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3587184E+04	-90.000
NORMALIZED	S11	=	.7925726E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3029689E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

INDIUM ARSENIDE

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
SHEAR WAVE VELOCITY		=	.2635453E+04		
INVERSE OF VELOCITY		=	.3794414E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.7511042E+07	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.	90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	.5481256E+04	-90.000	
(MAG, PHASE)	T22	=	0.	90.000	
	T23	=	0.	90.000	
	T33	=	0.	90.000	
NORMALIZED	S11	=	0.	90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	.6922525E-07	-90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	0.	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	.3648799E-03	0.000	
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	0.	0.000	
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	0.	90.000	
FIELD (MAG, PHASE)	E2	=	0.	90.000	
	E3	=	0.	90.000	
NORMALIZED ELECTRIC	D1	=	0.	90.000	
DISPLACEMENT	D2	=	.6230273E-08	90.000	
(MAG, PHASE)	D3	=	0.	90.000	

INDIUM ARSENIDE

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.4268715E+04	
INVERSE OF VELOCITY		=	.2342625E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1216584E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.6975912E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1657925E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3039809E+04	-90.000
NORMALIZED	S11	=	.6716326E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2867008E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.3022347E-08	90.000

INDIUM ARSENIDE

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.2635980E+04	
INVERSE OF VELOCITY		=	.3793656E-03	
DELTA V/V		=	.1997E-01	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6078295E-10	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5481804E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.6920452E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3648434E-03	180.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.1282653E+06	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.4865943E+02	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.3663232E-22	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

INDIUM ARSENIDE

REGULAR CONSTANTS

LAMBDA = 45.0000
NU = 0.0000
THETA = 0.0000

SECOND SHEAR WAVE VELOCITY		=	.1826462E+04	
INVERSE OF VELOCITY		=	.5475065E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.5205418E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.4563077E+04	-90.000
	T13	=	0.	90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.1199862E-06	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.4383007E-03	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	.8177972E-36	90.000

INDIUM ARSENIDE

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.4407817E+04	
INVERSE OF VELOCITY		=	.2268697E-03	
DELTA V/V		=	.9524E-02	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.7622976E-10	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7088661E+04	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2018395E+04	90.000
	T23	=	0.	90.000
	T33	=	.2018391E+04	90.000
NORMALIZED	S11	=	.6400919E-07	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2821407E-03	180.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.1145349E+05	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.2598449E+02	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.4158061E-13	-90.000
(MAG, PHASE)	D3	=	0.	90.000

INDIUM ARSENIDE

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.2130541E+04	
INVERSE OF VELOCITY		=	.4693644E-03	
DELTA V/V		=	.5300E-11	
POWER FLOW	PHI 12	=	-20.550	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.6072042E+07	0.
FLOW (RE IM)	P2	=	-.2276280E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.4928303E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1847505E+04	90.000
	T23	=	0.	90.000
	T33	=	.1847443E+04	-90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.9523855E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.4058192E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.4948788E-08	-90.000
(MAG, PHASE)	D3	=	0.	90.000

INDIUM ARSENIDE

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.2130530E+04	
INVERSE OF VELOCITY		=	.4693668E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	20.550	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.6072011E+07	0.
FLOW (RE IM)	P2	=	.2276218E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.4928290E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.1847471E+04	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.9523928E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.4058203E-03	180.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.4948730E-08	90.000

SINGLE CRYSTAL LEAD

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

LONGITUDINAL VELOCITY		=	.2029323E+04	
INVERSE OF VELOCITY		=	.4927752E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1185124E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.6885127E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.5840191E+04	-90.000
	T23	=	0.	90.000
	T33	=	.5840191E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.1431419E-06	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2904812E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

SINGLE CRYSTAL LEAD

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.1118034E+04	
INVERSE OF VELOCITY		=	.8944272E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.6529318E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.5110505E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.1750173E-06	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3913507E-03	0.000

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LEAD MOLYBDATE

LAMBDA =    90.0000                                        REGULAR CONSTANTS
MU     =    90.0000
THETA  =     0.0000

LONGITUDINAL WAVE VELOCITY                     =     .4006740E+04
INVERSE OF VELOCITY                            =     .2495794E-03

DELTA V/V                                      =     0.

POWER FLOW                  PHI 12             =      .000
ANGLES                      PHI 13             =   -15.088

COMPLEX POWER               P1                 =      .1392342E+08     0.
FLOW (RE IM)                P2                 =     0.                0.
                            P3                 =     -.3753791E+07     0.

NORMALIZED                  T11                =      .7351556E+04  -90.000
STRESS                      T12                =     0.              90.000
COMPONENTS                  T13                =      .1283865E+04   90.000
(MAG, PHASE)                T22                =      .3478932E+04  -90.000
                            T23                =     0.              90.000
                            T33                =      .4343718E+04  -90.000

NORMALIZED                  S11                =      .6588887E-07  -90.000
STRAIN                      S12                =     0.              90.000
COMPONENTS                  S13                =      .5753372E-08   90.000
(MAG, PHASE)                S22                =     0.              90.000
                            S23                =     0.              90.000
                            S33                =     0.              90.000

NORMALIZED                  U1                 =      .2639996E-03    0.000
MECHANICAL                  U2                 =     0.               0.000
DISPLACEMENT                U3                 =      .4610453E-04  180.000
(MAG, PHASE)
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LEAD MOLYBDATE

REGULAR CONSTANTS

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

FIRST SHEAR WAVE VELOCITY		=	.2123012E+04	
INVERSE OF VELOCITY		=	.4710288E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-.000	
	PHI 13	=	43.839	
COMPLEX POWER FLOW (RE IM)	P1	=	.7377468E+07	0.
	P2	=	0.	0.
	P3	=	.7084493E+07	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.9345452E+03	-90.000
	T12	=	0.	90.000
	T13	=	.5351305E+04	-90.000
	T22	=	.1575231E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4360977E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.2983393E-07	-90.000
	S12	=	0.	90.000
	S13	=	.8541617E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.6333780E-04	0.000
	U2	=	0.	0.000
	U3	=	.3626792E-03	0.000

LEAD MOLYBDATE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.1960032E+04	
INVERSE OF VELOCITY		=	.5101957E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6811112E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5219622E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.9774572E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3831695E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

LEAD MOLYBDATE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.3632388E+04	
INVERSE OF VELOCITY		=	.2753010E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.1262255E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7105645E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.4091364E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4091364E+04	-90.000
NORMALIZED	S11	=	.7748795E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2814663E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

LEAD MOLYBDATE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.1960032E+04	
INVERSE OF VELOCITY		=	.5101957E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.6811112E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5219622E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.9774572E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3831695E-03	0.000
(MAG, PHASE)				

LEAD MOLYBDATE

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

LONGITUDINAL WAVE VELOCITY		=	.4006740E+04	
INVERSE OF VELOCITY		=	.2495794E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	15.088	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1392342E+08	0.
	P2	=	.3753791E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.7351555E+04	-90.000
	T12	=	.1283866E+04	-90.000
	T13	=	0.	90.000
	T22	=	.4343718E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3478932E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.6588887E-07	-90.000
	S12	=	.5753372E-08	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2639995E-03	0.000
	U2	=	.4610453E-04	0.000
	U3	=	0.	0.000

LEAD MOLYBDATE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.2123012E+04	
INVERSE OF VELOCITY		=	.4710288E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-43.839	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.7377468E+07	0.
	P2	=	-.7084493E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.9345452E+03	90.000
	T12	=	.5351308E+04	-90.000
	T13	=	0.	90.000
	T22	=	.4360977E+04	90.000
	T23	=	0.	90.000
	T33	=	.1575231E+04	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.2983393E-07	90.000
	S12	=	.8541617E-07	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.6333780E-04	180.000
	U2	=	.3626792E-03	0.000
	U3	=	0.	0.000

LEAD MOLYBDATE

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

SECOND SHEAR WAVE VELOCITY		=	.1960032E+04	
INVERSE OF VELOCITY		=	.5101957E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6811112E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5219622E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.9774572F-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3831695E-03	0.000
(MAG, PHASE)				

LEAD SULPHIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.4066120E+04	
INVERSE OF VELOCITY		=	.2459347E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1524795E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.7809725E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.2078395E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2078395E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.6298165E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2560910E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

LEAD SULPHIDE

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
SHEAR WAVE VELOCITY		=	.1751190E+04	
INVERSE OF VELOCITY		=	.5710402E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6566963E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5125217E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.1114178E-06	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3902274E-03	0.000
(MAG, PHASE)				

LEAD SULPHIDE

LAMBDA = 45.0000				REGULAR CONSTANTS	
MU = 0.0000					
THETA = 0.0000					
LONGITUDINAL WAVE VELOCITY		=	.3678768E+04		
INVERSE OF VELOCITY		=	.2718301E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.1379538E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.7428426E+04	-90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.4061849E+04	-90.000	
	T23	=	0.	90.000	
	T33	=	.2415153E+04	-90.000	
NORMALIZED	S11	=	.7318647E-07	-90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.2692360E-03	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					

LEAD SULPHIDE

LAMBDA = 45.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
FIRST SHEAR WAVE VELOCITY		=	.2463060E+04	
INVERSE OF VELOCITY		=	.4059990E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9236477E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6078314E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.6679466E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3290386E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

LEAD SULPHIDE

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.1751190E+04	
INVERSE OF VELOCITY		=	.5710402E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6566963E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5125217E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.1114178E-06	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3902274E-03	0.000
(MAG, PHASE)				

LEAD SULPHIDE

REGULAR CONSTANTS

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

LONGITUDINAL WAVE VELOCITY		=	.3540245E+04	
INVERSE OF VELOCITY		=	.2824663E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-.000	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1327592E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.7287227E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.3721123E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3721151E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.7752369E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2744528E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

LEAD SULPHIDE

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.2250930E+04	
INVERSE OF VELOCITY		=	.4442608E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-15.595	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.8440983E+07	0.
	P2	=	-.2356037E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.5810676E+04	90.000
	T22	=	0.	90.000
	T23	=	.1621865E+04	-90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.7645597E-07	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3441941E-03	180.000

LEAD SULPHIDE

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.2250921E+04	
INVERSE OF VELOCITY		=	.4442625E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	15.596	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.8440955E+07	0.
FLOW (RE IM)	P2	=	.2356161E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5810665E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1621935E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1621851E+04	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.7645640E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3441947E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

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LITHIUM NIOBATE (SMITH AND WELSH)

LAMBDA =    90.0000                                          REGULAR CONSTANTS
MU     =    90.0000
THETA  =     0.0000

LONGITUDINAL WAVE VELOCITY                          =   .6883078E+04
INVERSE OF VELOCITY                                 =   .1452838E-03

DELTA V/V                                           =    .3785E+01

POWER FLOW                      PHI 12              =   9.384
ANGLES                          PHI 13              =   -.000

COMPLEX POWER                   P1                  =    .3004440E-12     0.
FLOW (RE IM)                    P2                  =    .4965392E-13     0.
                                P3                  =   0.                0.

NORMALIZED                      T11                 =    .7936030E+04   -90.000
STRESS                          T12                 =    .9457212E+03   -90.000
COMPONENTS                      T13                 =   0.               90.000
(MAG, PHASE)                    T22                 =    .2714800E+04   -90.000
                                T23                 =   0.               90.000
                                T33                 =    .1461076E+04   -90.000

NORMALIZED                      S11                 =    .3610106E-07   -90.000
STRAIN                          S12                 =    .2151046E-08   -90.000
COMPONENTS                      S13                 =   0.               90.000
(MAG, PHASE)                    S22                 =   0.               90.000
                                S23                 =   0.               90.000
                                S33                 =   0.               90.000

NORMALIZED                      U1                  =    .2484864E-03     0.000
MECHANICAL                      U2                  =    .2961164E-04     0.000
DISPLACEMENT                    U3                  =   0.                0.000
(MAG, PHASE)

ELECTRIC POTENTIAL              PHI                 =    .1824392E+07     0.000
(MAG, PHASE)

NORMALIZED ELECTRIC             E1                  =    .2650547E+03    90.000
FIELD (MAG, PHASE)              E2                  =   0.               90.000
                                E3                  =   0.               90.000

NORMALIZED ELECTRIC             D1                  =   0.               90.000
DISPLACEMENT                    D2                  =    .8303244E-08   -90.000
(MAG, PHASE)                    D3                  =   0.               90.000
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LITHIUM NIOBATE (SMITH AND WELSH)

LAMBDA = 90.0000			REGULAR CONSTANTS		
MU = 90.0000					
THETA = 0.0000					
FIRST SHEAR WAVE VELOCITY		=	.4496182E+04		
INVERSE OF VELOCITY		=	.2224109E-03		
DELTA V/V		=	.2069E+02		
POWER FLOW	PHI 12	=	-12.093		
ANGLES	PHI 13	=	.000		
COMPLEX POWER	P1	=	.1349782E-12	0.	
FLOW (RE IM)	P2	=	-.2891900E-13	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.7643526E+03	90.000	
STRESS	T12	=	.6414073E+04	-90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.6127816E+03	90.000	
	T23	=	0.	90.000	
	T33	=	.1356752E+04	90.000	
NORMALIZED	S11	=	.8148692E-08	90.000	
STRAIN	S12	=	.3418992E-07	-90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.3663801E-04	180.000	
MECHANICAL	U2	=	.3074482E-03	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	.2721875E+07	0.000	
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	.6053747E+03	90.000	
FIELD (MAG, PHASE)	E2	=	0.	90.000	
	E3	=	0.	90.000	
NORMALIZED ELECTRIC	D1	=	0.	90.000	
DISPLACEMENT	D2	=	.1874199E-09	90.000	
(MAG, PHASE)	D3	=	0.	90.000	

LITHIUM NIOBATE (SMITH AND WELSH)

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3962377E+04	
INVERSE OF VELOCITY		=	.2523738E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	6.655	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.9192715E+07	0.
FLOW (RE IM)	P2	=	.1072589E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6063898E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.7075241E+03	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4161907E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3298209E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.2022687E-06	90.000

LITHIUM NIOBATE (SMITH AND WELSH)

LAMBDA =	90.0000		REGULAR CONSTANTS
MU =	90.0000		
THETA =	90.0000		

LONGITUDINAL VELOCITY		=	.7333813E+04	
INVERSE OF VELOCITY		=	.1363547E-03	
DELTA V/V		=	.1445E+01	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.5868248E-12	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8249714E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2526814E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2526814E+04	-90.000
NORMALIZED	S11	=	.3305683E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2424325E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.1305407E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.1779983E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.2108998E-20	-90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

LITHIUM NIOBATE (SMITH AND WELSH)

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3580960E+04	
INVERSE OF VELOCITY		=	.2792547E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	8.130	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.6307823E+07	0.
FLOW (RE IM)	P2	=	.1186833E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5764660E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.8235229E+03	-90.000
	T23	=	0.	90.000
	T33	=	.8235229E+03	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.4844253E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3469415E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.3642878E-06	-90.000
(MAG, PHASE)	D3	=	0.	90.000

LITHIUM NIOBATE (SMITH AND WELSH)

REGULAR CONSTANTS

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

SECOND SHEAR WAVE VELOCITY		=	.3580960E+04	
INVERSE OF VELOCITY		=	.2792547E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-8.130	
	PHI 13	=	-.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.8367828E+07	0.
	P2	=	-.1186833E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.5764660E+04	-90.000
	T22	=	0.	90.000
	T23	=	.8235229E+03	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.4844253E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3469415E-03	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	.3642878E-06	-90.000

LITHIUM NIOBATE (SMITH AND WELSH)

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.6614378E+04	
INVERSE OF VELOCITY		=	.1511858E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1534535E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.7834630E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.2211450E+04	-90.000
	T23	=	.3280510E+03	-90.000
	T33	=	.2902287E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.3859424E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2552769E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	.9378400E-07	90.000
	D3	=	.8876675E-08	-90.000

LITHIUM NIOBATE (SMITH AND WELSH)

LAMBDA =	0.0000			REGULAR CONSTANTS	
MU =	0.0000				
THETA =	0.0000				
FIRST SHEAR WAVE VELOCITY			=	.4802878E+04	
INVERSE OF VELOCITY			=	.2082085E-03	
DELTA V/V			=	.1519E+02	
POWER FLOW		PHI 12	=	0.000	
ANGLES		PHI 13	=	0.000	
COMPLEX POWER		P1	=	.8605343E-13	0.
FLOW (RE IM)		P2	=	0.	0.
		P3	=	0.	0.
NORMALIZED		T11	=	0.	90.000
STRESS		T12	=	.4087870E+04	90.000
COMPONENTS		T13	=	.5278260E+04	-90.000
(MAG, PHASE)		T22	=	0.	90.000
		T23	=	0.	90.000
		T33	=	0.	90.000
NORMALIZED		S11	=	0.	90.000
STRAIN		S12	=	.1909616E-07	90.000
COMPONENTS		S13	=	.2465697E-07	-90.000
(MAG, PHASE)		S22	=	0.	90.000
		S23	=	0.	90.000
		S33	=	0.	90.000
NORMALIZED		U1	=	0.	0.000
MECHANICAL		U2	=	.1834330E-03	180.000
DISPLACEMENT		U3	=	.2368488E-03	0.000
(MAG, PHASE)					
ELECTRIC POTENTIAL		PHI	=	.3408913E+07	0.000
(MAG, PHASE)					
NORMALIZED ELECTRIC		E1	=	.7097646E+03	90.000
FIELD (MAG, PHASE)		E2	=	0.	90.000
		E3	=	0.	90.000
NORMALIZED ELECTRIC		D1	=	.1376849E-20	90.000
DISPLACEMENT		D2	=	0.	90.000
(MAG, PHASE)		D3	=	0.	90.000

LITHIUM NIOBATE (SMITH AND WELSH)

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.4058967E+04	
INVERSE OF VELOCITY		=	.2463681E-03	
DELTA V/V		=	.1490E+02	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9963595E-11	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.4852301E+04	-90.000
COMPONENTS	T13	=	.3757977E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.3173721E-07	-90.000
COMPONENTS	S13	=	.2457961E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2576406E-03	0.000
DISPLACEMENT	U3	=	.1995357E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.3168049E+06	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.7805063E+02	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.2072895E-19	-90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

ISOTROPIC LITHIUM NIOBATE

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

LONGITUDINAL VELOCITY		=	.6747261E+04	
INVERSE OF VELOCITY		=	.1482083E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1585605E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7963935E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2512713E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2512713E+04	-90.000
NORMALIZED	S11	=	.3721987E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2511321E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

ISOTROPIC LITHIUM NIOBATE

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
SHEAR WAVE VELOCITY		=	.3947259E+04	
INVERSE OF VELOCITY		=	.2533404E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9276058E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6091324E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4159036E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3283358E-03	0.000
(MAG, PHASE)				

LITHIUM TANTALATE (SMITH AND WELSH)

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.5688867E+04	
INVERSE OF VELOCITY		=	.1757819E-03	
DELTA V/V		=	.2227E+01	
POWER FLOW	PHI 12	=	12.633	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.6672657E-12	0.
FLOW (RE IM)	P2	=	.1495554E-12	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9063772E+04	-90.000
STRESS	T12	=	.1630233E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3050873E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1223531E+04	-90.000
NORMALIZED	S11	=	.3757233E-07	-90.000
STRAIN	S12	=	.3378927E-08	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2137440E-03	0.000
MECHANICAL	U2	=	.3844453E-04	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.1224195E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.2151914E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.1427748E-07	90.000
(MAG, PHASE)	D3	=	0.	90.000

LITHIUM TANTALATE (SMITH AND WELSH)

LAMBDA = 90.0000			REGULAR CONSTANTS		
MU = 90.0000					
THETA = 0.0000					
FIRST SHEAR WAVE VELOCITY		=	.3882959E+04		
INVERSE OF VELOCITY		=	.2575356E-03		
DELTA V/V		=	.7581E+01		
POWER FLOW	PHI 12	=	-16.506		
ANGLES	PHI 13	=	.000		
COMPLEX POWER	P1	=	.3626889E-12	0.	
FLOW (RE IM)	P2	=	-.1074737E-12	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.1346847E+04	90.000	
STRESS	T12	=	.7488201E+04	-90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.9731041E+03	90.000	
	T23	=	0.	90.000	
	T33	=	.1934383E+04	90.000	
NORMALIZED	S11	=	.1198404E-07	90.000	
STRAIN	S12	=	.3331444E-07	-90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.4653353E-04	180.000	
MECHANICAL	U2	=	.2587172E-03	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	.1660477E+07	0.000	
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	.4276313E+03	90.000	
FIELD (MAG, PHASE)	E2	=	0.	90.000	
	E3	=	0.	90.000	
NORMALIZED ELECTRIC	D1	=	0.	90.000	
DISPLACEMENT	D2	=	.4553935E-08	-90.000	
(MAG, PHASE)	D3	=	0.	90.000	

LITHIUM TANTALATE (SMITH AND WELSH)

LAMBDA = 90.0000				REGULAR CONSTANTS	
MU = 90.0000					
THETA = 0.0000					
SECOND SHEAR WAVE VELOCITY		=	.3530313E+04		
INVERSE OF VELOCITY		=	.2832610E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	-6.388		
ANGLES	PHI 13	=	-.000		
COMPLEX POWER	P1	=	.1315748E+08	0.	
FLOW (RE IM)	P2	=	-.1472957E+07	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.	90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	.7254647E+04	-90.000	
(MAG, PHASE)	T22	=	0.	90.000	
	T23	=	.8121456E+03	90.000	
	T33	=	0.	90.000	
NORMALIZED	S11	=	0.	90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	.3904546E-07	-90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	0.	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	.2756854E-03	0.000	
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	0.	0.000	
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	0.	90.000	
FIELD (MAG, PHASE)	E2	=	0.	90.000	
	E3	=	0.	90.000	
NORMALIZED ELECTRIC	D1	=	0.	90.000	
DISPLACEMENT	D2	=	0.	90.000	
(MAG, PHASE)	D3	=	.1304118E-06	90.000	

LITHIUM TANTALATE (SMITH AND WELSH)

LAMBDA = 90.0000 REGULAR CONSTANTS
MU = 90.0000
THETA = 90.0000

LONGITUDINAL VELOCITY		=	.6160962E+04	
INVERSE OF VELOCITY		=	.1623123E-03	
DELTA V/V		=	.5555E+00	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.2776089E-11	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9583715E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2713430E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2713430E+04	-90.000
NORMALIZED	S11	=	.3387252E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2086873E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.6001825E+06	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.9741702E+02	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.8484412E-20	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

LITHIUM TANTALATE (SMITH AND WELSH)

LAMBDA =	90.0000			REGULAR CONSTANTS	
MU =	90.0000				
THETA =	90.0000				
FIRST SHEAR WAVE VELOCITY			=	.3603653E+04	
INVERSE OF VELOCITY			=	.2774962E-03	
DELTA V/V			=	0.	
POWER FLOW		PHI 12	=	-6.132	
ANGLES		PHI 13	=	-.000	
COMPLEX POWER		P1	=	.1343082E+08	0.
FLOW (RE IM)		P2	=	-.1442980E+07	0.
		P3	=	0.	0.
NORMALIZED		T11	=	0.	90.000
STRESS		T12	=	.7329615E+04	-90.000
COMPONENTS		T13	=	0.	90.000
(MAG, PHASE)		T22	=	.7874793E+03	90.000
		T23	=	0.	90.000
		T33	=	.7874793E+03	-90.000
NORMALIZED		S11	=	0.	90.000
STRAIN		S12	=	.3765958E-07	-90.000
COMPONENTS		S13	=	0.	90.000
(MAG, PHASE)		S22	=	0.	90.000
		S23	=	0.	90.000
		S33	=	0.	90.000
NORMALIZED		U1	=	0.	0.000
MECHANICAL		U2	=	.2728656E-13	0.000
DISPLACEMENT		U3	=	0.	0.000
(MAG, PHASE)					
ELECTRIC POTENTIAL		PHI	=	0.	0.000
(MAG, PHASE)					
NORMALIZED ELECTRIC		E1	=	0.	90.000
FIELD (MAG, PHASE)		E2	=	0.	90.000
		E3	=	0.	90.000
NORMALIZED ELECTRIC		D1	=	0.	90.000
DISPLACEMENT		D2	=	.2059561E-06	-90.000
(MAG, PHASE)		D3	=	0.	90.000

LITHIUM TANTALATE (SMITH AND WELSH)

LAMBDA	=	90.0000	REGULAR CONSTANTS
MU	=	90.0000	
THETA	=	90.0000	

SECOND SHEAR WAVE VELOCITY		=	.3603653E+04	
INVERSE OF VELOCITY		=	.2774962E-03	
DELTA V/V		=	.5173E-12	
POWER FLOW ANGLES	PHI 12	=	6.132	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1343682E+08	0.
	P2	=	.1442980E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.7329615E+04	-90.000
	T22	=	0.	90.000
	T23	=	.7874793E+03	-90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.3785958E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.2728656E-03	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	.2059561E-06	-90.000

LITHIUM TANTALATE (SMITH AND WELSH)

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.5552395E+04	
INVERSE OF VELOCITY		=	.1801025E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2069377E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9098082E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1742017E+04	-90.000
	T23	=	.4117496E+03	90.000
	T33	=	.3214814E+04	-90.000
NORMALIZED	S11	=	.3959131E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2198265E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.6611748E-07	90.000
(MAG, PHASE)	D3	=	.1504470E-07	90.000

LITHIUM TANTALATE (SMITH AND WELSH)

LAMBDA	=	0.0000	REGULAR CONSTANTS
MU	=	0.0000	
THETA	=	0.0000	

FIRST SHEAR WAVE VELOCITY		=	.4211571E+04	
INVERSE OF VELOCITY		=	.2374411E-03	
DELTA V/V		=	.1070E+02	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2198450E-12	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.4558595E+04	90.000
COMPONENTS	T13	=	.6481150E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.1723945E-07	90.000
COMPONENTS	S13	=	.2451007E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.1452103E-03	180.000
DISPLACEMENT	U3	=	.2064518E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.2132759E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.5064046E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.2584243E-20	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

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MICROWAVE ACOUSTICS HANDBOOK. VOLUME 3. BULK WAVE VELOCITIES.(U)
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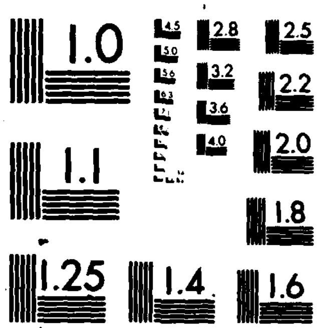
5 of 6



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

LITHIUM TANTALATE (SMITH AND WELSH)

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
SECOND SHEAR WAVE VELOCITY		=	.3367086E+04	
INVERSE OF VELOCITY		=	.2969928E-03	
DELTA V/V		=	.1416E+00	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	4509469E-10	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5795049E+04	-90.000
COMPONENTS	T13	=	.4076018E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.3428699E-07	-90.000
COMPONENTS	S13	=	.2411617E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2308945E-03	0.000
DISPLACEMENT	U3	=	.1624024E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.1489146E+05	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.4422655E+02	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.1443507E-19	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

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MAGNESIUM OXIDE

LAMBDA =     0.0000                                                    REGULAR CONSTANTS
MU     =     0.0000
THETA  =     0.0000

LONGITUDINAL VELOCITY                                   =    .9095272E+04
INVERSE OF VELOCITY                                     =    .1099472E-03

DELTA V/V                                               =    0.

POWER FLOW                         PHI 12               =    0.000
ANGLES                             PHI 13               =    0.000

COMPLEX POWER                      P1                   =     .1629418E+08    0.
FLOW (RE IM)                       P2                   =    0.               0.
                                   P3                   =    0.               0.

NORMALIZED                         T11                  =     .8073210E+04  -90.000
STRESS                             T12                  =    0.              90.000
COMPONENTS                         T13                  =    0.              90.000
(MAG, PHASE)                       T22                  =     .2587567E+04  -90.000
                                   T23                  =    0.              90.000
                                   T33                  =     .2587567E+04  -90.000

NORMALIZED                         S11                  =     .2723755E-07  -90.000
STRAIN                             S12                  =    0.              90.000
COMPONENTS                         S13                  =    0.              90.000
(MAG, PHASE)                       S22                  =    0.              90.000
                                   S23                  =    0.              90.000
                                   S33                  =    0.              90.000

NORMALIZED                         U1                   =     .2477329E-03    0.000
MECHANICAL                         U2                   =    0.               0.000
DISPLACEMENT                       U3                   =    0.               0.000
(MAG, PHASE)
```

MAGNESIUM OXIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.6598404E+04	
INVERSE OF VELOCITY		=	.1515519E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1182104E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6876348E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.2203958E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2908521E-03	0.000
(MAG, PHASE)				

MAGNESIUM OXIDE

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.9907470E+04	
INVERSE OF VELOCITY		=	.1009339E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1774923E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0	0.
NORMALIZED	T11	=	.8425968E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.9511257E+03	-90.000
	T23	=	0.	90.000
	T33	=	.2275994E+04	-90.000
NORMALIZED	S11	=	.2395783E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2373615E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

MAGNESIUM OXIDE

LAMBDA = 45.0000 REGULAR CONSTANTS
MU = 0.0000
THETA = 0.0000

FIRST SHEAR WAVE VELOCITY		=	.6598404E+04	
INVERSE OF VELOCITY		=	.1515518E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1182104E+06	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6876348E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.2203958E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2908521E-03	0.000
(MAG, PHASE)				

MAGNESIUM OXIDE

LAMBDA = 45.0000
ML = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.5301409E+04	
INVERSE OF VELOCITY		=	.1886291E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.9497475E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.6163595E+04	-90.000
	T13	=	0.	90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.3060375E-07	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.3244860E-03	0.000
	U3	=	0.	0.000

MAGNESIUM OXIDE

REGULAR CONSTANTS

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

LONGITUDINAL WAVE VELOCITY		=	.1016379E+05	
INVERSE OF VELOCITY		=	.9838849E-04	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	.000	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1820843E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.8534267E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.1340403E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1340389E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.2305729E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2343493E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

MAGNESIUM OXIDE

LAMBDA = 45.0000
ML = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.5766238E+04	
INVERSE OF VELOCITY		=	.1734233E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	12.343	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1033022E+08	0.
FLOW (RE IM)	P2	=	.2260446E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6428131E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.1406596E+04	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.2697680E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3111324E-03	180.000
(MAG, PHASE)				

MAGNESIUM OXIDE

REGULAR CONSTANTS

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

SECOND SHEAR WAVE VELOCITY		=	.5766256E+04	
INVERSE OF VELOCITY		=	.1734228E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-12.343	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1033025E+08	0.
	P2	=	-.2260514E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.6428140E+04	-90.000
	T13	=	0.	90.000
	T22	=	.1406623E+04	90.000
	T23	=	0.	90.000
	T33	=	.1406584E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.2697868E-07	-90.000
	S13	=	0	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.3111320E-03	0.000
	U3	=	0.	0.000

SINGLE CRYSTAL NICKEL

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.5278747E+04	
INVERSE OF VELOCITY		=	.1894389E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2349042E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9693384E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.5980193E+04	-90.000
	T23	=	0.	90.000
	T33	=	.5980193E+04	-90.000
NORMALIZED	S11	=	.3908623E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2063263E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SINGLE CRYSTAL NICKEL

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

SHEAR WAVE VELOCITY		=	.3610223E+04	
INVERSE OF VELOCITY		=	.2769912E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1606549E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.8016356E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.3455326E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2494899E-03	0.000
(MAG, PHASE)				

ISOTROPIC NICKEL

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
LONGITUDINAL VELOCITY		=	.5916080E+04	
INVERSE OF VELOCITY		=	.1690309E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2632655E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.1026188E+05	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.4140991E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4140991E+04	-90.000
NORMALIZED	S11	=	.3294344E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.1948960E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

ISOTROPIC NICKEL

LAMBDA	=	0.0000	REGULAR CONSTANTS
MU	=	0.0000	
THETA	=	0.0000	

SHEAR WAVE VELOCITY		=	.3230821E+04	
INVERSE OF VELOCITY		=	.3095189E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1437715E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.7583443E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4081509E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2637324E-03	0.000
(MAG, PHASE)				

QUARTZ

LAMBDA = 90.0000 REGULAR CONSTANTS
MU = 90.0000
THETA = 0.0000

LONGITUDINAL WAVE VELOCITY		=	.5996013E+04	
INVERSE OF VELOCITY		=	.1667775E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	23.665	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.7944717E+07	0.
FLOW (RE IM)	P2	=	.3481726E+07	0.
	P3	=	0	0.
NORMALIZED	T11	=	.5084210E+04	-90.000
STRESS	T12	=	.2435094E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.6350376E+03	-90.000
	T23	=	0.	90.000
	T33	=	.8395546E+02	90.000
NORMALIZED	S11	=	.5336450E-07	-90.000
STRAIN	S12	=	.1277952E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3199742E-03	0.000
MECHANICAL	U2	=	.1532524E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.1016303E-07	90.000

QUARTZ

LAMBDA = 90.0000				REGULAR CONSTANTS	
MU = 90.0000					
THETA = 0.0000					
FIRST SHEAR WAVE VELOCITY		=	.4314379E+04		
INVERSE OF VELOCITY		=	.2317830E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	-25.807		
ANGLES	PHI 13	=	.000		
COMPLEX POWER	P1	=	.5716553E+07	0.	
FLOW (RE IM)	P2	=	-.2764354E+07	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.2065587E+04	90.000	
STRESS	T12	=	.4312721E+04	-90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.4983196E+03	90.000	
	T23	=	0.	90.000	
	T33	=	.1858156E+04	90.000	
NORMALIZED	S11	=	.4187560E-07	90.000	
STRAIN	S12	=	.4371584E-07	-90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.1806672E-03	180.000	
MECHANICAL	U2	=	.3772134E-03	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	0.	0.000	
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	0.	90.000	
FIELD (MAG, PHASE)	E2	=	0.	90.000	
	E3	=	0.	90.000	
NORMALIZED ELECTRIC	D1	=	0.	90.000	
DISPLACEMENT	D2	=	0.	90.000	
(MAG, PHASE)	D3	=	.3611001E-03	-90.000	

QUARTZ

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3913978E+04	
INVERSE OF VELOCITY		=	.2554945E-03	
DELTA V/V		=	.9230E+00	
POWER FLOW	PHI 12	=	-24.003	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.2725299E-12	0.
FLOW (RE IM)	P2	=	-.1213558E-12	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.4554567E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.2028113E+04	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.5609634E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.4391196E-03	180.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.1915547E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.4894113E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.1934209E-21	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

QUARTZ

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.6354318E+04	
INVERSE OF VELOCITY		=	.1573733E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.8419471E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.5803265E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.6454099E+03	-90.000
	T23	=	0.	90.000
	T33	=	.6454099E+03	-90.000
NORMALIZED	S11	=	.5423612E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3446336E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.1346063E-36	-90.000
(MAG, PHASE)	D3	=	.1346063E-36	90.000

QUARTZ .2369E+02 .5133E+01

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.4674297E+04	
INVERSE OF VELOCITY		=	.2139359E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-17.179	
	PHI 13	=	-.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.6193444E+07	0.
	P2	=	-.1914726E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.4977326E+04	-90.000
	T13	=	0.	90.000
	T22	=	.1538759E+04	90.000
	T23	=	0.	90.000
	T33	=	.1538759E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.4298209E-07	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.4018222E-03	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	.3490146E-08	-90.000

QUARTZ .2069E+02 .5133E+01

LAMBDA = 90.0000		REGULAR CONSTANTS
MU = 90.0000		
THETA = 90.0000		

SECOND SHEAR WAVE VELOCITY		=	.4674297E+04	
INVERSE OF VELOCITY		=	.2139359E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	17.179	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.6193444E+07	0.
FLOW (RE IM)	P2	=	.1914726E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.4977326E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.1538759E+04	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4298209E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.4018222E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.3490146E-06	90.000
(MAG, PHASE)	D3	=	0.	90.000

QUARTZ

LAMBDA = 0.0000				REGULAR CONSTANTS	
MU = 0.0000					
THETA = 0.0000					
LONGITUDINAL WAVE VELOCITY		=	.5744429E+04		
INVERSE OF VELOCITY		=	.1740817E-03		
DELTA V/V		=	.4274E+00		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.3999841E-12	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.5517742E+04	-90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.3946240E+03	-90.000	
	T23	=	.1140645E+04	90.000	
	T33	=	.7508768E+03	-90.000	
NORMALIZED	S11	=	.6309889E-07	-90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.3624671E-03	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	.1581170E+07	0.000	
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	.2752528E+03	90.000	
FIELD (MAG, PHASE)	E2	=	0.	90.000	
	E3	=	0.	90.000	
NORMALIZED ELECTRIC	D1	=	.3432634E-20	-90.000	
DISPLACEMENT	D2	=	0.	90.000	
(MAG, PHASE)	D3	=	0.	90.000	

QUARTZ

LAMBDA = 0.0000				REGULAR CONSTANTS	
MU = 0.0000					
THETA = 0.0000					
FIRST SHEAR WAVE VELOCITY		=	.5099814E+04		
INVERSE OF VELOCITY		=	.1960856E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.6757253E+07	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.		90.000
STRESS	T12	=	.2725843E+04		90.000
COMPONENTS	T13	=	.4427052E+04		-90.000
(MAG, PHASE)	T22	=	0.		90.000
	T23	=	0.		90.000
	T33	=	0.		90.000
NORMALIZED	S11	=	0.		90.000
STRAIN	S12	=	.1977499E-07		90.000
COMPONENTS	S13	=	.3211665E-07		-90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	0.		0.000
MECHANICAL	U2	=	.2016976E-03		180.000
DISPLACEMENT	U3	=	.3275778E-03		0.000
(MAG, PHASE)					
ELECTRIC POTENTIAL	PHI	=	0.		0.000
(MAG, PHASE)					
NORMALIZED ELECTRIC	E1	=	0.		90.000
FIELD (MAG, PHASE)	E2	=	0.		90.000
	E3	=	0.		90.000
NORMALIZED ELECTRIC	D1	=	0.		90.000
DISPLACEMENT	D2	=	.9370919E-08		-90.000
(MAG, PHASE)	D3	=	0.		90.000

QUARTZ

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3298286E+04	
INVERSE OF VELOCITY		=	.3031877E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.4370230E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.3560260E+04	-90.000
	T13	=	.2192138E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.6174888E-07	-90.000
	S13	=	.3802027E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.4073310E-03	0.000
	U3	=	.2508035E-03	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	.1803087E-07	90.000
	D3	=	0.	90.000

RUTILE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.7883497E+04	
INVERSE OF VELOCITY		=	.1268473E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1687068E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8214788E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.4200042E+04	-90.000
	T23	=	0.	90.000
	T33	=	.5342700E+04	-90.000
NORMALIZED	S11	=	.3088266E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2434634E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

RUTILE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.6645215E+04	
INVERSE OF VELOCITY		=	.1504842E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	.000	
	PHI 13	=	-.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1422075E+06	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.7542084E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.1995260E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.2651787E-03	0.000

RUTILE

LAMBDA = 90.0000			REGULAR CONSTANTS	
MU = 90.0000				
THETA = 0.0000				
SECOND SHEAR WAVE VELOCITY		=	.5382561E+04	
INVERSE OF VELOCITY		=	.1857852E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1151868E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6787836E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.2737031E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2946447E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

RUTILE

LAMBDA = 90.0000				REGULAR CONSTANTS	
MU = 90.0000					
THETA = 90.0000					
LONGITUDINAL VELOCITY		=	.1047917E+05		
INVERSE OF VELOCITY		=	.9542737E-04		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	.000		
ANGLES	PHI 13	=	.000		
COMPLEX POWER	P1	=	.2242543E+08		0.
FLOW (RE IM)	P2	=	0.		0.
	P3	=	0.		0.
NORMALIZED	T11	=	.9471100E+04		-90.000
STRESS	T12	=	0.		90.000
COMPONENTS	T13	=	0.		90.000
(MAG, PHASE)	T22	=	.2740574E+04		-90.000
	T23	=	0.		90.000
	T33	=	.2740574E+04		-90.000
NORMALIZED	S11	=	.2015128E-07		-90.000
STRAIN	S12	=	0.		90.000
COMPONENTS	S13	=	0.		90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	.2111687E-03		0.000
MECHANICAL	U2	=	0.		0.000
DISPLACEMENT	U3	=	0.		0.000
(MAG, PHASE)					

RUTILE

LAMBDA = 90.0000			REGULAR CONSTANTS	
MU = 90.0000				
THETA = 90.0000				
SHEAR WAVE VELOCITY		=	.5382561E+04	
INVERSE OF VELOCITY		=	.1857852E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1151868E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6787836E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.2737031E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2946447E-03	0.000
(MAG, PHASE)				

RUTILE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.7883497E+04	
INVERSE OF VELOCITY		=	.1268473E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1687068E+00	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8214788E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.5342700E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4200042E+04	-90.000
NORMALIZED	S11	=	.3088266E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2434634E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

RUTILE

```
LAMBDA =     0.0000                                              REGULAR CONSTANTS
ML     =     0.0000
THETA  =     0.0000

FIRST SHEAR  WAVE VELOCITY                         =    .6645215E+04
INVERSE OF VELOCITY                                =    .1504842E-03

DELTA V/V                                          =    0.

POWER FLOW                      PHI 12             =    0.000
ANGLES                          PHI 13             =    0.000

COMPLEX POWER                   P1                 =     .1422075E+08     0.
FLOW (RE IM)                    P2                 =    0.                0.
                                P3                 =    0.                0.

NORMALIZED                      T11                =    0.                90.000
STRESS                          T12                =     .7542084E+04    -90.000
COMPONENTS                      T13                =    0.                90.000
(MAG, PHASE)                    T22                =    0.                90.000
                                T23                =    0.                90.000
                                T33                =    0.                90.000

NORMALIZED                      S11                =    0.                90.000
STRAIN                          S12                =     .1995260E-07    -90.000
COMPONENTS                      S13                =    0.                90.000
(MAG, PHASE)                    S22                =    0.                90.000
                                S23                =    0.                90.000
                                S33                =    0.                90.000

NORMALIZED                      U1                 =    0.                0.000
MECHANICAL                      U2                 =     .2651787E-03     0.000
DISPLACEMENT                    U3                 =    0.                0.000
(MAG, PHASE)
```

RUTILE

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
SECOND SHEAR WAVE VELOCITY		=	.5382561E+04		
INVERSE OF VELOCITY		=	.1857852F-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.1151868E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.		90.000
STRESS	T12	=	0.		90.000
COMPONENTS	T13	=	.6787836E+04		-90.000
(MAG, PHASE)	T22	=	0.		90.000
	T23	=	0.		90.000
	T33	=	0.		90.000
NORMALIZED	S11	=	0.		90.000
STRAIN	S12	=	0.		90.000
COMPONENTS	S13	=	.2737031E-07		-90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	0.		0.000
MECHANICAL	U2	=	0.		0.000
DISPLACEMENT	U3	=	.2946447E-03		0.000
(MAG, PHASE)					

SAPPHIRE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.1119237E+05	
INVERSE OF VELOCITY		=	.8934662E-04	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PH 12	=	4.651	
	PH 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.2227281F+08	0.
	P2	=	.1812138E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.9417799E+04	-90.000
	T12	=	.6295127E+03	-90.000
	T13	=	0.	90.000
	T22	=	.2096745E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3068221E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.1888959E-07	-90.000
	S12	=	.6313172E-09	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2114192E-03	0.000
	U2	=	.1413187E-04	0.000
	U3	=	0.	0.000

SAPPHIRE

LAMBDA = 90.0000 REGULAR CONSTANTS
MU = 90.0000
THETA = 0.0000

FIRST SHEAR WAVE VELOCITY		=	.6467934E+04	
INVERSE OF VELOCITY		=	.1546089E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	-8.034	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1287119E+08	0.
	P2	=	-.1816654E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.7175288E+04	-90.000
	T22	=	0.	90.000
	T23	=	.1012728E+04	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.2154741E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.2787345E-03	0.000

SAPPHIRE

LAMBDA = 90.0000 REGULAR CONSTANTS
MU = 90.0000
THETA = 0.0000

SECOND SHEAR WAVE VELOCITY		=	.5044832E+04	
INVERSE OF VELOCITY		=	.1654306E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-6.692	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.1202922E+08	0.
FLOW (RE IM)	P2	=	-.1411472E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.4626320E+03	90.000
STRESS	T12	=	.6921188E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3531076E+03	90.000
	T23	=	0.	90.000
	T33	=	.1640108E+04	90.000
NORMALIZED	S11	=	.3181150E-08	90.000
STRAIN	S12	=	.2379573E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.1922952E-04	180.000
MECHANICAL	U2	=	.2876824E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SAPPHIRE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.1118596E+05	
INVERSE OF VELOCITY		=	.8939781E-04	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.2226005E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9436112E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2103230E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2103230E+04	-90.000
NORMALIZED	S11	=	.1894802E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2119517E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SAPPHIRE .5133E+01 .2069E+02

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.6077390E+04	
INVERSE OF VELOCITY		=	.1645443E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	9.083	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.1209401E+08	0.
FLOW (RE IM)	P2	=	.1933396E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6355288E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.1111900E+04	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.2365744E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2875510E-03	0.000
(MAG, PHASE)				

SAPPHIRE .5133E+01 .2069E+02

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.6077390E+04	
INVERSE OF VELOCITY		=	.1645443E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-9.983	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.1209401E+06	0.
FLOW (RE IM)	P2	=	-.1933396E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6955268E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1119090E+04	90.000
	T23	=	0.	90.000
	T33	=	.1111930E+04	-90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.2365744E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2875510E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SAPPHIRE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.1117472E+05	
INVERSE OF VELOCITY		=	.8948770E-04	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2223769E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9431372E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3112163E+04	-90.000
	T23	=	.4459502E+03	90.000
	T33	=	.2106403E+04	-90.000
NORMALIZED	S11	=	.1897650E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2120582E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SAPPHIRE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.5765868E+04	
INVERSE OF VELOCITY		=	.1478007E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1346408E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6103077E+04	-90.000
COMPONENTS	T13	=	.4075385E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.1674899E-07	-90.000
COMPONENTS	S13	=	.1118429E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2266430E-03	0.000
DISPLACEMENT	U3	=	.1513429E-03	180.000
(MAG, PHASE)				

SAPPHIRE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.5743855E+04	
INVERSE OF VELOCITY		=	.1740991E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1143027E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.3754988E+04	-90.000
COMPONENTS	T13	=	.5623269E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.1429844E-07	-90.000
COMPONENTS	S13	=	.2141257E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.1642563E-03	0.000
DISPLACEMENT	U3	=	.2459814E-03	0.000
(MAG, PHASE)				

SILICON

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.8440654E+04	
INVERSE OF VELOCITY		=	.1184742E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.9833362E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.6271638E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.2414203E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2414203E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.3778095E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.3188959E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

SILICON

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
SHEAR WAVE VELOCITY		=	.5844920E+04		
INVERSE OF VELOCITY		=	.1710887E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.6809332E+07	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.		90.000
STRESS	T12	=	0.		90.000
COMPONENTS	T13	=	.5218939E+04		-90.000
(MAG, PHASE)	T22	=	0.		90.000
	T23	=	0.		90.000
	T33	=	0.		90.000
NORMALIZED	S11	=	0.		90.000
STRAIN	S12	=	0.		90.000
COMPONENTS	S13	=	.3278228E-07		-90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	0.		0.000
MECHANICAL	U2	=	0.		0.000
DISPLACEMENT	U3	=	.3832196E-03		0.000
(MAG, PHASE)					

SILICON

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.9137716E+04	
INVERSE OF VELOCITY		=	.1094365E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1064544E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.6525470E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1185687E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2143292E+04	-90.000
NORMALIZED	S11	=	.3354135E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3064913E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SILICON

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.5844920E+04	
INVERSE OF VELOCITY		=	.1710887E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6809332E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5218939E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.3278228E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3832196E-03	0.000
(MAG, PHASE)				

SILICON

LAMBDA = 45.0000 REGULAR CONSTANTS
MU = 0.0000
THETA = 0.0000

SECOND SHEAR WAVE VELOCITY		=	.4680798E+04	
INVERSE OF VELOCITY		=	.2136388E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.5453130E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.4670387E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.4574327E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.4282300E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SILICON

LAMBDA = 45.0000				REGULAR CONSTANTS	
MU = 90.0000					
THETA = 35.2640					
LONGITUDINAL WAVE VELOCITY		=	.3358539E+04		
INVERSE OF VELOCITY		=	.1068543E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	.000		
ANGLES	PHI 13	=	-.000		
COMPLEX POWER	P1	=	.1090270E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.6603847E+04	-90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.1451945E+04	-90.000	
	T23	=	0.	90.000	
	T33	=	.1451935E+04	-90.000	
NORMALIZED	S11	=	.3236122E-07	-90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.3028538E-03	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					

SILICON

REGULAR CONSTANTS

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

FIRST SHEAR WAVE VELOCITY		=	.5098451E+04	
INVERSE OF VELOCITY		=	.1961380E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	12.528	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.5939695E+07	0.
	P2	=	.1319865E+07	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.4874298E+04	90.000
	T22	=	0.	90.000
	T23	=	.1083122E+04	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.4023923E-07	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.4103155E-03	180.000

SILICON

LAMBDA = 45.0000   REGULAR CONSTANTS
MU = 90.0000
THETA = 35.2640

SECOND SHEAR WAVE VELOCITY		=	.5098466E+04	
INVERSE OF VELOCITY		=	.1961374E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-12.529	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.5939713E+07	0.
FLOW (RE IM)	P2	=	-.1319905E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.4874305E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1083145E+04	90.000
	T23	=	0	90.000
	T33	=	.1083111E+04	-90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.4023905E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.4103143E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SINGLE CRYSTAL SILVER

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.3408672E+04	
INVERSE OF VELOCITY		=	.2933693E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1789553E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8460622E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.6380141E+04	-90.000
	T23	=	0.	90.000
	T33	=	.6380141E+04	-90.000
NORMALIZED	S11	=	.6934936E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2363892E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

SINGLE CRYSTAL SILVER

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.2060975E+04
INVERSE OF VELOCITY		=	.4852072E-03
DELTA V/V		=	0.
POWER FLOW	PHI 12	=	0.000
ANGLES	PHI 13	=	0.000

COMPLEX POWER	P1	=	.1082012E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6578790E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.7375325E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3040073E-03	0.000
(MAG, PHASE)				

ISOTROPIC SILVER

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.3813510E+04	
INVERSE OF VELOCITY		=	.2622256E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2002093E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8948950E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.5092755E+04	-90.000
	T23	=	0.	90.000
	T33	=	.5092755E+04	-90.000
NORMALIZED	S11	=	.5860478E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2234899E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

ISOTROPIC SILVER

LAMBDA = 0.0000				REGULAR CONSTANTS	
MU = 0.0000					
THETA = 0.0000					
SHEAR WAVE VELOCITY		=	.1770122E+04		
INVERSE OF VELOCITY		=	.5649327E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.9293143E+07	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.	90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	.6096931E+04	-90.000	
(MAG, PHASE)	T22	=	0.	90.000	
	T23	=	0.	90.000	
	T33	=	0.	90.000	
NORMALIZED	S11	=	0.	90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	.9265853E-07	-90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	0.	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	.3280339E-03	0.000	
(MAG, PHASE)					

POLYCRYSTALLINE SILVER

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
LONGITUDINAL VELOCITY		=	.3696846E+04	
INVERSE OF VELOCITY		=	.2705009E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1940844E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8811002E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.5086435E+04	-90.000
	T23	=	0.	90.000
	T33	=	.5086435E+04	-90.000
NORMALIZED	S11	=	.6140071E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2269889E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

POLYCRYSTALLINE SILVER

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
SHEAR WAVE VELOCITY		=	.1698739E+04		
INVERSE OF VELOCITY		=	.5886719E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.8918380E+07	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.		90.000
STRESS	T12	=	0.		90.000
COMPONENTS	T13	=	.5972731E+04		-90.000
(MAG, PHASE)	T22	=	0.		90.000
	T23	=	0.		90.000
	T33	=	0.		90.000
NORMALIZED	S11	=	0.		90.000
STRAIN	S12	=	0.		90.000
COMPONENTS	S13	=	.9855992E-07		-90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	0.		0.000
MECHANICAL	U2	=	0.		0.000
DISPLACEMENT	U3	=	.3348552E-03		0.000
(MAG, PHASE)					

MAGNESIUM ALUMINATE SPINEL

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.8826732E+04	
INVERSE OF VELOCITY		=	.1132922E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1580426E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.7950915E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.4360179E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4360179E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.2849790E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2515434E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

MAGNESIUM ALUMINATE SPINEL

LAMBDA = 0.0000 REGULAR CONSTANTS
MU = 0.0000
THETA = 0.0000

SHEAR WAVE VELOCITY		=	.6536474E+04	
INVERSE OF VELOCITY		=	.1529877E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1170356E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.6842092E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.2235978E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.2923082E-03	0.000

MAGNESIUM ALUMINATE SPINEL

LAMBDA = 45.0000				REGULAR CONSTANTS	
MU = 0.0000					
THETA = 0.0000					
LONGITUDINAL WAVE VELOCITY		=	.1015105E+05		
INVERSE OF VELOCITY		=	.9851195E-04		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.1817546E+08		0.
FLOW (RE IM)	P2	=	0.		0.
	P3	=	0.		0.
NORMALIZED	T11	=	.8526537E+04		-90.000
STRESS	T12	=	0.		90.000
COMPONENTS	T13	=	0.		90.000
(MAG, PHASE)	T22	=	.1455750E+04		-90.000
	T23	=	0.		90.000
	T33	=	.3535393E+04		-90.000
NORMALIZED	S11	=	.2310715E-07		-90.000
STRAIN	S12	=	0.		90.000
COMPONENTS	S13	=	0.		90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	.2345618E-03		0.000
MECHANICAL	U2	=	0.		0.000
DISPLACEMENT	U3	=	0.		0.000
(MAG, PHASE)					

MAGNESIUM ALUMINATE SPINEL

LAMBDA = 45.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
FIRST SHEAR WAVE VELOCITY		=	.6536474E+04		
INVERSE OF VELOCITY		=	.1529877E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.1170356E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.	90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	.6842092E+04	-90.000	
(MAG, PHASE)	T22	=	0.	90.000	
	T23	=	0.	90.000	
	T33	=	0.	90.000	
NORMALIZED	S11	=	0.	90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	.2235978E-07	-90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	0.	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	.2923082E-03	0.000	
(MAG, PHASE)					

MAGNESIUM ALUMINATE SPINEL

```
LAMBDA =    45.0000                                                      REGULAR CONSTANTS
MU     =     0.0000
THETA  =     0.0000

SECOND SHEAR WAVE VELOCITY                              =     .4194383E+04
INVERSE OF VELOCITY                                     =     .2384141E-03

DELTA V/V                                               =     0.

POWER FLOW                           PHI 12             =     0.000
ANGLES                               PHI 13             =     0.000

COMPLEX POWER                        P1                 =      .7510043E+07       0.
FLOW (RE IM)                         P2                 =     0.                  0.
                                     P3                 =     0.                  0.

NORMALIZED                           T11                =     0.               90.000
STRESS                               T12                =      .5480892E+04   -90.000
COMPONENTS                           T13                =     0.               90.000
(MAG, PHASE)                         T22                =     0.               90.000
                                     T23                =     0.               90.000
                                     T33                =     0.               90.000

NORMALIZED                           S11                =     0.               90.000
STRAIN                               S12                =      .4349914E-07   -90.000
COMPONENTS                           S13                =     0.               90.000
(MAG, PHASE)                         S22                =     0.               90.000
                                     S23                =     0.               90.000
                                     S33                =     0.               90.000

NORMALIZED                           U1                 =     0.                0.000
MECHANICAL                           U2                 =      .3649041E-03     0.000
DISPLACEMENT                         U3                 =     0.                0.000
(MAG, PHASE)
```

MAGNESIUM ALUMINATE SPINEL

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.1055563E+05	
INVERSE OF VELOCITY		=	.9473615E-04	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1889986E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8694794E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2026615E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2026596E+04	-90.000
NORMALIZED	S11	=	.2179146E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2300227E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

MAGNESIUM ALUMINATE SPINEL

LAMBDA = 45.0000			REGULAR CONSTANTS	
MU = 90.0000				
THETA = 35.2640				
FIRST SHEAR WAVE VELOCITY		=	.5096132E+04	
INVERSE OF VELOCITY		=	.1962273E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-24.523	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.9124624E+07	0.
FLOW (RE IM)	P2	=	-.4162718E+07	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6041399E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2756112E+04	90.000
	T23	=	0.	90.000
	T33	=	.2756027E+04	-90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.3248044E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3310492E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

MAGNESIUM ALUMINATE SPINEL

LAMBDA = 45.0000			REGULAR CONSTANTS		
MU = 90.0000					
THETA = 35.2640					
SECOND SHEAR WAVE VELOCITY		=	.5096100E+04		
INVERSE OF VELOCITY		=	.1962285E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	24.522		
ANGLES	PHI 13	=	.000		
COMPLEX POWER	P1	=	.9124568E+07	0.	
FLOW (RE IM)	P2	=	.4162615E+07	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	0.		90.000
STRESS	T12	=	0.		90.000
COMPONENTS	T13	=	.6041380E+04		90.000
(MAG, PHASE)	T22	=	0.		90.000
	T23	=	.2756069E+04		90.000
	T33	=	0.		90.000
NORMALIZED	S11	=	0.		90.000
STRAIN	S12	=	0.		90.000
COMPONENTS	S13	=	.3248074E-07		90.000
(MAG, PHASE)	S22	=	0.		90.000
	S23	=	0.		90.000
	S33	=	0.		90.000
NORMALIZED	U1	=	0.		0.000
MECHANICAL	U2	=	0.		0.000
DISPLACEMENT	U3	=	.3310502E-03		180.000
(MAG, PHASE)					

TELLURIUM DIOXIDE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.3049399E+04	
INVERSE OF VELOCITY		=	.3279335E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.9132949E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.6044154E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2365575E+04	-90.000
	T23	=	0.	90.000
	T33	=	.5555847E+04	-90.000
NORMALIZED	S11	=	.1085126E-06	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3308983E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

TELLURIUM DIOXIDE

LAMBDA = 90.0000			REGULAR CONSTANTS	
MU = 90.0000				
THETA = 0.0000				
FIRST SHEAR WAVE VELOCITY		=	.3316876E+04	
INVERSE OF VELOCITY		=	.3014885E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.9934045E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6303664E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4782750E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3172758E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

TELLURIUM DIOXIDE

LAMBDA = 90.0000 REGULAR CONSTANTS
MU = 90.0000
THETA = 0.0000

SECOND SHEAR WAVE VELOCITY		=	.2103340E+04	
INVERSE OF VELOCITY		=	.4754343E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6299504E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5019763E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.9471250E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3984252E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.4091580E-07	-90.000

TELLURIUM DIOXIDE

LAMBDA = 90.0000			REGULAR CONSTANTS	
MU = 90.0000				
THETA = 90.0000				
LONGITUDINAL VELOCITY		=	.4202710E+04	
INVERSE OF VELOCITY		=	.2379417E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1258712E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7095665E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.1462055E+04	-90.000
	T23	=	0.	90.000
	T33	=	.1462056E+04	-90.000
NORMALIZED	S11	=	.6706678E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2818622E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.5884223E-36	90.000
(MAG, PHASE)	D3	=	.5884223E-36	-90.000

TELLURIUM DIOXIDE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.2103340E+04	
INVERSE OF VELOCITY		=	.4754343E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.6299504E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5019763E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.9471250E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3984252E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.4091580E-07	-90.000
(MAG, PHASE)	D3	=	0.	90.000

TELLURIUM DIOXIDE

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
LONGITUDINAL WAVE VELOCITY		=	.3316876E+04	
INVERSE OF VELOCITY		=	.3014885E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9934045E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6303664E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.4782750E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3172758E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

TELLURIUM DIOXIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3049399E+04	
INVERSE OF VELOCITY		=	.3279335E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9132949E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.6044154E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.5555847E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2365575E+04	-90.000
NORMALIZED	S11	=	.1085126E-06	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.3308983E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

TELLURIUM DIOXIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.2103340E+04	
INVERSE OF VELOCITY		=	.4754343E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.6299504E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5019763E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.9471250E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3984252E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	.4091580E-07	90.000
(MAG, PHASE)	D3	=	0.	90.000

TELLURIUM DIOXIDE

LAMBDA =	45.0000		REGULAR CONSTANTS
MU =	0.0000		
THETA =	0.0000		

LONGITUDINAL WAVE VELOCITY		=	.4463729E+04	
INVERSE OF VELOCITY		=	.2240279E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1336887E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.7312692E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.7628238E+03	90.000
	T23	=	0.	90.000
	T33	=	.1335708E+04	-90.000
NORMALIZED	S11	=	.6127099E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2734971E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

TELLURIUM DIOXIDE

REGULAR CONSTANTS

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

FIRST SHEAR WAVE VELOCITY		=	.2103340E+04	
INVERSE OF VELOCITY		=	.4754343E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.6299504E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.5019763E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.9471250E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.3984252E-03	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	.4091580E-07	90.000
	D3	=	0.	90.000

TELLURIUM DIOXIDE

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.6128834E+03	
INVERSE OF VELOCITY		=	.1631632E-02	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1835586E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.2709676E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.6021502E-06	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.7380957E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

YTTRIUM ALUMINUM GARNET

LAMBDA = 0.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
LONGITUDINAL VELOCITY		=	.8567765E+04		
INVERSE OF VELOCITY		=	.1167166E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.1949165E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.8829873E+04	-90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.2934479E+04	-90.000	
	T23	=	0.	90.000	
	T33	=	.2934479E+04	-90.000	
NORMALIZED	S11	=	.2643675E-07	-90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.2265038E-03	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					

YTTRIUM ALUMINUM GARNET

LAMBDA =	0.0000			REGULAR CONSTANTS	
MU =	0.0000				
THETA =	0.0000				
SHEAR WAVE VELOCITY			=	.5027397E+04	
INVERSE OF VELOCITY			=	.1989101E-03	
DELTA V/V			=	0.	
POWER FLOW		PHI 12	=	0.000	
ANGLES		PHI 13	=	0.000	
COMPLEX POWER		P1	=	.1143733E+08	0.
FLOW (RE IM)		P2	=	0.	0.
		P3	=	0.	0.
NORMALIZED		T11	=	0.	90.000
STRESS		T12	=	0.	90.000
COMPONENTS		T13	=	.6763824E+04	-90.000
(MAG, PHASE)		T22	=	0.	90.000
		T23	=	0.	90.000
		T33	=	0.	90.000
NORMALIZED		S11	=	0.	90.000
STRAIN		S12	=	0.	90.000
COMPONENTS		S13	=	.2940793E-07	-90.000
(MAG, PHASE)		S22	=	0.	90.000
		S23	=	0.	90.000
		S33	=	0.	90.000
NORMALIZED		U1	=	0.	0.000
MECHANICAL		U2	=	0.	0.000
DISPLACEMENT		U3	=	.2956907E-03	0.000
(MAG, PHASE)					

YTTRIUM ALUMINUM GARNET

LAMBDA	=	45.0000
MU	=	0.0000
THETA	=	0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.8612539E+04	
INVERSE OF VELOCITY		=	.1161098E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1959353E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8852915E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2819817E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2911625E+04	-90.000
NORMALIZED	S11	=	.2623086E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2259143E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM ALUMINUM GARNET

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.5027397E+04
INVERSE OF VELOCITY		=	.1989101E-03
DELTA V/V		=	0.

POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1143733E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.6763824E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.2940793E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.2956907E-03	0.000

YTTRIUM ALUMINUM GARNET

LAMBDA =	45.0000		REGULAR CONSTANTS
MU =	0.0000		
THETA =	0.0000		

SECOND SHEAR WAVE VELOCITY		=	.4950302E+04	
INVERSE OF VELOCITY		=	.2020079E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1126194E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0	90.000
STRESS	T12	=	.6711762E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.3009759E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2979843E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM ALUMINUM GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.8627412E+04	
INVERSE OF VELOCITY		=	.1159096E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.1962736E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8860556E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.2843053E+04	-90.000
	T23	=	0.	90.000
	T33	=	.2843052E+04	-90.000
NORMALIZED	S11	=	.2616306E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2257195E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM ALUMINUM GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.4976134E+04	
INVERSE OF VELOCITY		=	.2009592E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.839	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1132070E+08	0.
FLOW (RE IM)	P2	=	-.1657853E+06	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6729251E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.9854606E+02	90.000
	T23	=	0.	90.000
	T33	=	.9854416E+02	-90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.2986353E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2972093E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM ALUMINUM GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.4976133E+04	
INVERSE OF VELOCITY		=	.2009593E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.839	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1132070E+08	0.
FLOW (RE IM)	P2	=	.1657821E+06	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6729250E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.9854419E+02	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.2986354E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2972099E-03	0.000
(MAG, PHASE)				

YTTRIUM GALLIUM GARNET

LAMBDA = 0.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
LONGITUDINAL VELOCITY		=	.7080831E+04	
INVERSE OF VELOCITY		=	.1412264E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2049901E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9055165E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3658873E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3658873E+04	-90.000
NORMALIZED	S11	=	.3119244E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2208684E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM GALLIUM GARNET

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.4061275E+04	
INVERSE OF VELOCITY		=	.2462281E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1175739E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6857811E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.3590477E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2916383E-03	0.000
(MAG, PHASE)				

YTTRIUM GALLIUM GARNET

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.7189755E+04	
INVERSE OF VELOCITY		=	.1390868E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.2081434E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9124547E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3301665E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3576042E+04	-90.000
NORMALIZED	S11	=	.3048629E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2191890E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM GALLIUM GARNET

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.4061275E+04	
INVERSE OF VELOCITY		=	.2462281E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1175739E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	0.	90.000
	T13	=	.6857811E+04	-90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	0.	90.000
	S13	=	.3590477E-07	-90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	0.	0.000
	U3	=	.2916383E-03	0.000

YTTRIUM GALLIJM GARNET

LAMBDA = 45.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3865172E+04	
INVERSE OF VELOCITY		=	.2587207E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1118967E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6690193E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.3867164E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.2989450E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM GALLIUM GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.7225698E+04	
INVERSE OF VELOCITY		=	.1383949E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.2091840E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.9147326E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3367840E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3367836E+04	-90.000
NORMALIZED	S11	=	.3025910E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2186431E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM GALLIUM GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3931625E+04	
INVERSE OF VELOCITY		=	.2543478E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	2.714	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1138205E+08	0.
FLOW (RE IM)	P2	=	.5395505E+06	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6747460E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.3198540E+03	-90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.3769533E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.2964078E-03	0.000
(MAG, PHASE)				

YTTRIUM GALLIUM GARNET

LAMBDA =	45.0000			REGULAR CONSTANTS	
MU =	90.0000				
THETA =	35.2640				
SECOND SHEAR WAVE VELOCITY			=	.3931628E+04	
INVERSE OF VELOCITY			=	.2543476E-03	
DELTA V/V			=	0.	
POWER FLOW		PHI 12	=	-2.714	
ANGLES		PHI 13	=	-.000	
COMPLEX POWER		P1	=	.1138206E+08	0.
FLOW (RE IM)		P2	=	-.5395605E+06	0.
		P3	=	0.	0.
NORMALIZED		T11	=	0.	90.000
STRESS		T12	=	.6747462E+04	-90.000
COMPONENTS		T13	=	0.	90.000
(MAG, PHASE)		T22	=	.3198598E+03	90.000
		T23	=	0.	90.000
		T33	=	.3198537E+03	-90.000
NORMALIZED		S11	=	0.	90.000
STRAIN		S12	=	.3769530E-07	-90.000
COMPONENTS		S13	=	0.	90.000
(MAG, PHASE)		S22	=	0.	90.000
		S23	=	0.	90.000
		S33	=	0.	90.000
NORMALIZED		U1	=	0.	0.000
MECHANICAL		U2	=	.2964077E-03	0.000
DISPLACEMENT		U3	=	0.	0.000
(MAG, PHASE)					

YTTRIUM IRON GARNET

REGULAR CONSTANTS

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

LONGITUDINAL VELOCITY		=	.7213248E+04	
INVERSE OF VELOCITY		=	.1386338E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1864625E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.8636260E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.3467346E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3467346E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.3210506E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2315817E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000

YTTRIUM IRON GARNET

LAMBDA =	0.0000		REGULAR CONSTANTS
MU =	0.0000		
THETA =	0.0000		

SHEAR WAVE VELOCITY		=	.3844160E+04	
INVERSE OF VELOCITY		=	.2601349E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9937153E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6304650E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4126080E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3172262E-03	0.000
(MAG, PHASE)				

YTTRIUM IRON GARNET

LAMBDA = 45.0000			REGULAR CONSTANTS		
MU = 0.0000					
THETA = 0.0000					
LONGITUDINAL WAVE VELOCITY		=	.7158066E+04		
INVERSE OF VELOCITY		=	.1397025E-03		
DELTA V/V		=	0.		
POWER FLOW	PHI 12	=	0.000		
ANGLES	PHI 13	=	0.000		
COMPLEX POWER	P1	=	.1850360E+08	0.	
FLOW (RE IM)	P2	=	0.	0.	
	P3	=	0.	0.	
NORMALIZED	T11	=	.8603162E+04	-90.000	
STRESS	T12	=	0.	90.000	
COMPONENTS	T13	=	0.	90.000	
(MAG, PHASE)	T22	=	.3640674E+04	-90.000	
	T23	=	0.	90.000	
	T33	=	.3507518E+04	-90.000	
NORMALIZED	S11	=	.3247702E-07	-90.000	
STRAIN	S12	=	0.	90.000	
COMPONENTS	S13	=	0.	90.000	
(MAG, PHASE)	S22	=	0.	90.000	
	S23	=	0.	90.000	
	S33	=	0.	90.000	
NORMALIZED	U1	=	.2324727E-03	0.000	
MECHANICAL	U2	=	0.	0.000	
DISPLACEMENT	U3	=	0.	0.000	
(MAG, PHASE)					

YTTRIUM IRON GARNET

LAMBDA = 45.0000			REGULAR CONSTANTS	
MU = 0.0000				
THETA = 0.0000				
FIRST SHEAR WAVE VELOCITY		=	.3945960E+04	
INVERSE OF VELOCITY		=	.2534238E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1020031E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.6387584E+04	-90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.3967443E-07	-90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3131074E-03	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM IRON GARNET

LAMBDA = 45.0000
ML = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.3844160E+04	
INVERSE OF VELOCITY		=	.2601349E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.9937153E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6304650E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4126080E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3172262E-03	0.000
(MAG, PHASE)				

YTTRIUM IRON GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.7139577E+04	
INVERSE OF VELOCITY		=	.1400643E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.1845581E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8592045E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3610265E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3610268E+04	-90.000
NORMALIZED	S11	=	.3260326E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2327735E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				

YTTRIUM IRON GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.3912321E+04	
INVERSE OF VELOCITY		=	.2556027E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	1.399	
	PHI 13	=	.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1011334E+08	0.
	P2	=	.2470127E+06	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.6360297E+04	-90.000
	T13	=	0.	90.000
	T22	=	.1553467E+03	-90.000
	T23	=	0.	90.000
	T33	=	.1553437E+03	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.4018723E-07	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.3144507E-03	0.000
	U3	=	0.	0.000

YTTRIUM IRON GARNET

LAMBDA = 45.0000
MU = 90.0000
THETA = 35.2640

REGULAR CONSTANTS .

SECOND SHEAR WAVE VELOCITY		=	.3912320E+04	
INVERSE OF VELOCITY		=	.2556028E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-1.399	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.1011335E+08	0.
FLOW (RE IM)	P2	=	-.2470081E+06	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.6360300E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	.1553437E+03	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.4018722E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3144506E-03	0.000
(MAG, PHASE)				

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MICROWAVE ACOUSTICS HANDBOOK. VOLUME 3. BULK WAVE VELOCITIES.(U)
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6 of 6

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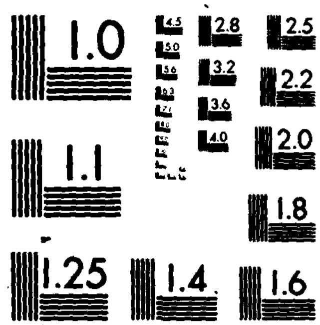

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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LAMBDA = 90.0000			REGULAR CONSTANTS	
MU = 90.0000				
THETA = 0.0000				
LONGITUDINAL WAVE VELOCITY		=	.5080447E+04	
INVERSE OF VELOCITY		=	.1644616E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	.000	
	PHI 13	=	-.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.1726847E+08	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	.8311069E+04	-90.000
	T12	=	0.	90.000
	T13	=	0.	90.000
	T22	=	.4155535E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4788759E+04	-90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	.3957652E-07	-90.000
	S12	=	0.	90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	.2406429E-03	0.000
	U2	=	0.	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PH	=	0.	0.000

ZINC OXIDE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.2883391E+04	
INVERSE OF VELOCITY		=	.3468139E-03	
DELTA V/V		=	.5133E+01	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1277770E-12	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	.5723227E+04	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	.6059761E-07	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	.3494532E-03	180.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.2797522E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.9702196E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.2824776E-21	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

ZINC OXIDE

LAMBDA = 90.0000
MU = 90.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.2799019E+04	
INVERSE OF VELOCITY		=	.3572680E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.7949214E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5638870E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.6335809E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3546810E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

ZINC OXIDE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

LONGITUDINAL VELOCITY		=	.6330383E+04	
INVERSE OF VELOCITY		=	.1579683E-03	
DELTA V/V		=	.3720E+01	
POWER FLOW	PHI 12	=	.000	
ANGLES	PHI 13	=	.000	
COMPLEX POWER	P1	=	.8459645E-13	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8480162E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.3580574E+04	-90.000
	T23	=	0.	90.000
	T33	=	.3580574E+04	-90.000
NORMALIZED	S11	=	.3725596E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2358445E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.3438143E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.5431176E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.5207455E-21	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

ZINC OXIDE

LAMBDA = 90.0000
MU = 90.0000
THETA = 90.0000

REGULAR CONSTANTS

SHEAR WAVE VELOCITY		=	.2735397E+04	
INVERSE OF VELOCITY		=	.3655777E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	-.000	
ANGLES	PHI 13	=	-.000	
COMPLEX POWER	P1	=	.7768526E+07	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5574415E+04	-90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.6558136E-07	-90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3587820E-03	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.7738600E-07	90.000

ZINC OXIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

LONGITUDINAL WAVE VELOCITY		=	.6080447E+04	
INVERSE OF VELOCITY		=	.1644616E-03	
DELTA V/V		=	0.	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1726847E+08	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	.8311069E+04	-90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	0.	90.000
(MAG, PHASE)	T22	=	.4788759E+04	-90.000
	T23	=	0.	90.000
	T33	=	.4155535E+04	-90.000
NORMALIZED	S11	=	.3957652E-07	-90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	0.	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	.2406429E-03	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	0.	0.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	0.	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	0.	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	0.	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	.2414168E-07	90.000

ZINC OXIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

FIRST SHEAR WAVE VELOCITY		=	.2883391E+04	
INVERSE OF VELOCITY		=	.3468139E-03	
DELTA V/V		=	.5133E+01	
POWER FLOW	PHI 12	=	0.000	
ANGLES	PHI 13	=	0.000	
COMPLEX POWER	P1	=	.1277770E-12	0.
FLOW (RE IM)	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED	T11	=	0.	90.000
STRESS	T12	=	0.	90.000
COMPONENTS	T13	=	.5723227E+04	90.000
(MAG, PHASE)	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED	S11	=	0.	90.000
STRAIN	S12	=	0.	90.000
COMPONENTS	S13	=	.6059761E-07	90.000
(MAG, PHASE)	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED	U1	=	0.	0.000
MECHANICAL	U2	=	0.	0.000
DISPLACEMENT	U3	=	.3494532E-03	180.000
(MAG, PHASE)				
ELECTRIC POTENTIAL	PHI	=	.2797522E+07	0.000
(MAG, PHASE)				
NORMALIZED ELECTRIC	E1	=	.9702195E+03	90.000
FIELD (MAG, PHASE)	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC	D1	=	.2824776E-21	90.000
DISPLACEMENT	D2	=	0.	90.000
(MAG, PHASE)	D3	=	0.	90.000

ZINC OXIDE

LAMBDA = 0.0000
MU = 0.0000
THETA = 0.0000

REGULAR CONSTANTS

SECOND SHEAR WAVE VELOCITY		=	.2799019E+04	
INVERSE OF VELOCITY		=	.3572680E-03	
DELTA V/V		=	0.	
POWER FLOW ANGLES	PHI 12	=	0.000	
	PHI 13	=	0.000	
COMPLEX POWER FLOW (RE IM)	P1	=	.7949214E+07	0.
	P2	=	0.	0.
	P3	=	0.	0.
NORMALIZED STRESS COMPONENTS (MAG, PHASE)	T11	=	0.	90.000
	T12	=	.5638870E+04	-90.000
	T13	=	0.	90.000
	T22	=	0.	90.000
	T23	=	0.	90.000
	T33	=	0.	90.000
NORMALIZED STRAIN COMPONENTS (MAG, PHASE)	S11	=	0.	90.000
	S12	=	.6335809E-07	-90.000
	S13	=	0.	90.000
	S22	=	0.	90.000
	S23	=	0.	90.000
	S33	=	0.	90.000
NORMALIZED MECHANICAL DISPLACEMENT (MAG, PHASE)	U1	=	0.	0.000
	U2	=	.3546810E-03	0.000
	U3	=	0.	0.000
ELECTRIC POTENTIAL (MAG, PHASE)	PHI	=	0.	0.000
NORMALIZED ELECTRIC FIELD (MAG, PHASE)	E1	=	0.	90.000
	E2	=	0.	90.000
	E3	=	0.	90.000
NORMALIZED ELECTRIC DISPLACEMENT (MAG, PHASE)	D1	=	0.	90.000
	D2	=	0.	90.000
	D3	=	0.	90.000

5. MATERIAL CONSTANTS

The material constants[13] used for the computations in this report are listed in this section.

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13. Slobodnik, A. J., Jr., Conway, E. D., and Delmonico, R. T. (1973) Microwave Acoustics Handbook, Volume 1A, Surface Wave Velocities, TR-73-0597, AD 780172, National Technical Information Services, Springfield, Virginia 22151.

$c_{11} = 1.113$	$c_{12} = 0.591$	$c_{13} = 0.591$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$
$c_{21} = 0.591$	$c_{22} = 1.113$	$c_{23} = 0.591$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$
$c_{31} = 0.591$	$c_{32} = 0.591$	$c_{33} = 1.113$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.261$	$c_{45} = 0$	$c_{46} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.261$	$c_{56} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.261$

$\rho = 2.70 \times 10^3$ kg/m^3

Elastic Constants (in 10^{11} N/m^2)

Material: Aluminum

Crystal Group: Isotropic

References: (Anderson, 65)

$c^E_{11} = 2.39$	$c_{12} = 1.04$	$c_{13} = 0.50$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = -0.4$
$c_{21} = 1.04$	$c_{22} = 2.47$	$c_{23} = 0.52$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = -0.3$
$c_{31} = 0.50$	$c_{32} = 0.52$	$c_{33} = 1.35$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 4.3$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.65$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 3.4$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.66$	$c_{56} = 0$	$e_{15} = 2.8$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.76$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 2.8$	$e_{16} = 0$	$\epsilon^S_{11} = 196.0$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 3.4$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 201.0$	$\epsilon_{23} = 0$
$e_{31} = -0.4$	$e_{32} = -0.3$	$e_{33} = 4.3$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 28.0$

$\rho = 5.30 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: $Ba_2NaNb_5O_{15}$

Crystal Group: 2mm

References: (Warner, Coquin and Fink, 69)

$c^E_{11} = 1.28$	$c_{12} = 0.305$	$c_{13} = 0.305$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 0.305$	$c_{22} = 1.28$	$c_{23} = 0.305$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 0.305$	$c_{32} = 0.305$	$c_{33} = 1.28$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.255$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0.99$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.255$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = 0.99$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.255$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0.99$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0.99$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 34.2$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = 0.99$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 34.2$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0.99$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 34.2$

$\rho = 9.2 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: $Bi_{12}GeO_{20}$

Crystal Group: 23

Reference: (Slobodnik & Sethares, 71)

$c^E_{11} = 1.2848$	$c_{12} = 0.2942$	$c_{13} = 0.2942$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 0.2942$	$c_{22} = 1.2848$	$c_{23} = 0.2942$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 0.2942$	$c_{32} = 0.2942$	$c_{33} = 1.2848$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.2552$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0.983$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.2552$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = 0.983$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.2552$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0.983$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0.983$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 33.6$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = 0.983$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 33.6$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0.983$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 33.6$

$\rho = 9.2 \times 10^3\ kg/m^3$

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: $Bi_{12}GeO_{20}$

Crystal Group: 23

References: (Kraut et al, 1970)

$c_{11}^E = 0.907$	$c_{12} = 0.581$	$c_{13} = 0.510$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = -0.244$
$c_{21} = 0.581$	$c_{22} = 0.907$	$c_{23} = 0.510$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = -0.244$
$c_{31} = 0.510$	$c_{32} = 0.510$	$c_{33} = 0.938$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0.44$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.150$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = -0.210$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.150$	$c_{56} = 0$	$e_{15} = -0.21$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.163$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = -0.210$	$e_{16} = 0$	$\epsilon_{11}^S = 7.98$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = -0.210$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 7.98$	$\epsilon_{23} = 0$
$e_{31} = -0.244$	$e_{32} = -0.244$	$e_{33} = 0.44$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 8.43$

$\rho = 4.82 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: CdS

Crystal Group: 6mm

References: (Berlincourt, et al, 63) (Jaffee and Berlincourt, 65)

$c_{11} = 3.140$	$c_{12} = 0.8341$	$c_{13} = 0.8341$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$
$c_{21} = 0.8341$	$c_{22} = 3.140$	$c_{23} = 0.8341$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$
$c_{31} = 0.8341$	$c_{32} = 0.8341$	$c_{33} = 3.140$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 1.153$	$c_{45} = 0$	$c_{46} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 1.153$	$c_{56} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 1.153$

$\rho = 7.1 \times 10^3$ kg/m^3

Elastic Constants (in 10^{11} N/m^2)

Material: Chromium
Crystal Group: Polycrystalline
References: (Smithells, 67)

$c_{11} = 2.106$	$c_{12} = 1.078$	$c_{13} = 1.078$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$
$c_{21} = 1.078$	$c_{22} = 2.106$	$c_{23} = 1.078$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$
$c_{31} = 1.078$	$c_{32} = 1.078$	$c_{33} = 2.106$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.514$	$c_{45} = 0$	$c_{46} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.514$	$c_{56} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.514$

$\rho = 8.96 \times 10^3$ kg/m^3

<u>Elastic Constants (in 10^{11} N/m^2)</u>

Material: Copper

Crystal Group: Isotropic

References: (Anderson, 65)

c_{11} = 10.76	c_{12} = 1.250	c_{13} = 1.250	c_{14} = 0	c_{15} = 0	c_{16} = 0
c_{21} = 1.250	c_{22} = 10.76	c_{23} = 1.250	c_{24} = 0	c_{25} = 0	c_{26} = 0
c_{31} = 1.250	c_{32} = 1.250	c_{33} = 10.76	c_{34} = 0	c_{35} = 0	c_{36} = 0
c_{41} = 0	c_{42} = 0	c_{43} = 0	c_{44} = 5.758	c_{45} = 0	c_{46} = 0
c_{51} = 0	c_{52} = 0	c_{53} = 0	c_{54} = 0	c_{55} = 5.758	c_{56} = 0
c_{61} = 0	c_{62} = 0	c_{63} = 0	c_{64} = 0	c_{65} = 0	c_{66} = 5.758

$\rho = 3.512 \times 10^3$

Elastic Constants (in 10^{11} N/m^2)

Material: Diamond

Crystal Group: Cubic

References: (McSkimin & Bond, 57)

c_{11} = 2.51	c_{12} = 1.07	c_{13} = 1.07	c_{14} = 0	c_{15} = 0	c_{16} = 0
c_{21} = 1.07	c_{22} = 2.51	c_{23} = 1.07	c_{24} = 0	c_{25} = 0	c_{26} = 0
c_{31} = 1.07	c_{32} = 1.07	c_{33} = 2.51	c_{34} = 0	c_{35} = 0	c_{36} = 0
c_{41} = 0	c_{42} = 0	c_{43} = 0	c_{44} = 0.762	c_{45} = 0	c_{46} = 0
c_{51} = 0	c_{52} = 0	c_{53} = 0	c_{54} = 0	c_{55} = 0.762	c_{56} = 0
c_{61} = 0	c_{62} = 0	c_{63} = 0	c_{64} = 0	c_{65} = 0	c_{66} = 0.762

$\rho = 6.28 \times 10^3$

<u>Elastic Constants (in 10^{11} N/m^2)</u>

Material: $Eu_3Fe_5O_{12}$

Crystal Group: Cubic

References: (Bateman, 66)

$c^E_{11} = 0.785$	$c_{12} = 0.161$	$c_{13} = 0.161$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 0.161$	$c_{22} = 0.785$	$c_{23} = 0.161$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 0.161$	$c_{32} = 0.161$	$c_{33} = 0.785$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.312$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.312$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.312$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 3.32$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 3.32$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 3.32$

$\rho = 2.2 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: Fused Quartz

Crystal Group: Isotropic

References: (Mason, 58; Dell Optics, 68)

$c_{11} = 2.858$	$c_{12} = 1.150$	$c_{13} = 1.150$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$
$c_{21} = 1.150$	$c_{22} = 2.858$	$c_{23} = 1.150$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$
$c_{31} = 1.150$	$c_{32} = 1.150$	$c_{33} = 2.858$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.903$	$c_{45} = 0$	$c_{46} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.903$	$c_{56} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.903$

$\rho = 7.094 \times 10^3$ kg/m^3

Elastic Constants (in 10^{11} N/m^2)

Material: Gadolinium Gallium Garnet
Crystal Group: Cubic
References: (Graham and Chang, 70)

c^E_{11} = 1.19	c_{12} = 0.538	e_{13} = 0.538	c_{14} = 0	c_{15} = 0	c_{16} = 0	e_{11} = 0	e_{21} = 0	e_{31} = 0
c_{21} = 0.538	c_{22} = 1.19	c_{23} = 0.538	c_{24} = 0	c_{25} = 0	c_{26} = 0	e_{12} = 0	e_{22} = 0	e_{32} = 0
c_{31} = 0.538	c_{32} 0.538	c_{33} = 1.19	c_{34} = 0	c_{35} = 0	c_{36} = 0	e_{13} = 0	e_{23} = 0	e_{33} = 0
c_{41} = 0	c_{42} = 0	c_{43} = 0	c_{44} = 0.595	c_{45} = 0	c_{46} = 0	e_{14} = - 0.160	e_{24} = 0	e_{34} = 0
c_{51} = 0	c_{52} = 0	c_{53} = 0	c_{54} = 0	c_{55} = 0.595	c_{56} = 0	e_{15} = 0	e_{25} = - 0.160	e_{35} = 0
c_{61} = 0	c_{62} = 0	c_{63} = 0	c_{64} = 0	c_{65} = 0	c_{66} = 0.595	e_{16} = 0	e_{26} = 0	e_{36} = - 0.160
e_{11} = 0	e_{12} = 0	e_{13} = 0	e_{14} = - 0.160	e_{15} = 0	e_{16} = 0	ϵ^S_{11} = 9.735	ϵ_{12} = 0	ϵ_{13} = 0
e_{21} = 0	e_{22} = 0	e_{23} = 0	e_{24} = 0	e_{25} = - 0.160	e_{26} = 0	ϵ_{21} = 0	ϵ_{22} = 9.735	ϵ_{23} = 0
e_{31} = 0	e_{32} = 0	e_{33} = 0	e_{34} = 0	e_{35} = 0	e_{36} = - 0.160	ϵ_{31} = 0	ϵ_{32} = 0	ϵ_{33} = 9.735

$\rho = 5.31 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: GaAs

Crystal Group: $\bar{4}3m$

References: (Drabble and Brammer, 66) (Walsh, 66) (Arlt and Quadflieg, 68)

$c^E_{11} = 1.29$	$c_{12} = 0.479$	$c_{13} = 0.479$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 0.479$	$c_{22} = 1.29$	$c_{23} = 0.479$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 0.479$	$c_{32} = 0.479$	$c_{33} = 1.29$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.67$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.67$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.67$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 14.16$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 14.16$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 14.16$

$\rho = 5.32 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: Germanium

Crystal Group: m3m

References: (Eagle-Picher; Conwell, 52)

$c_{11} = 2.202$	$c_{12} = 1.604$	$c_{13} = 1.604$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$
$c_{21} = 1.604$	$c_{22} = 2.202$	$c_{23} = 1.604$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$
$c_{31} = 1.604$	$c_{32} = 1.604$	$c_{33} = 2.202$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.299$	$c_{45} = 0$	$c_{46} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.299$	$c_{56} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.299$

$\rho = 19.3 \times 10^3$ kg/m^3

<u>Elastic Constants (in 10^{11} N/m^2)</u>

Material: Gold

Crystal Group: Isotropic

References: (Anderson, 65)

$c^E_{11} = 0.672$	$c_{12} = 0.367$	$c_{13} = 0.367$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 0.367$	$c_{22} = 0.672$	$c_{23} = 0.367$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 0.367$	$c_{32} = 0.367$	$c_{33} = 0.672$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.302$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = -0.071$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.302$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = -0.071$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.302$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = -0.071$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = -0.071$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 14.15$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = -0.071$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 14.15$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = -0.071$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 14.15$

$\rho = 5.77 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: InSb

Crystal Group: $\bar{4}3m$

References: (Potter, 56) (Pauwels, 64) (Arlt and Quadflieg, 68)

$c_{11}^{E} = 0.8329$	$c_{12} = 0.4526$	$c_{13} = 0.4526$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 0.4526$	$c_{22} = 0.8329$	$c_{23} = 0.4526$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 0.4526$	$c_{32} = 0.4526$	$c_{33} = 0.8329$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.3959$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = -0.045$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.3959$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = -0.045$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.3959$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = -0.045$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = -0.045$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon_{11}^{S} = 12.8$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = -0.045$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 12.8$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = -0.045$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 12.8$

$\rho = 5.70 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: InAs

Crystal Group: $\bar{4}3m$

References: (Gerlich, 64) (Landolt - Börnstein) (Arlt and Quadflieg, 68)

$c_{11} = 1.092$	$c_{12} = 0.683$	$c_{13} = 0.528$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0.136$
$c_{21} = 0.683$	$c_{22} = 1.092$	$c_{23} = 0.528$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = -0.136$
$c_{31} = 0.528$	$c_{32} = 0.528$	$c_{33} = 0.917$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.267$	$c_{45} = 0$	$c_{46} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.267$	$c_{56} = 0$
$c_{61} = 0.136$	$c_{62} = 0.136$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.337$

$\rho = 6.95 \times 10^3$ kg/m^3

Elastic Constants (in 10^{11} N/m^2)

Material: Lead Molybdate

Crystal Group: 4/m

References: (Coquin, Pinnow & Warner, 71)

c_{11} = 1.24	c_{12} = 0.33	c_{13} = 0.33	c_{14} = 0	c_{15} = 0	c_{16} = 0
c_{21} = 0.33	c_{22} = 1.24	c_{23} = 0.33	c_{24} = 0	c_{25} = 0	c_{26} = 0
c_{31} = 0.33	c_{32} = 0.33	c_{33} = 1.24	c_{34} = 0	c_{35} = 0	c_{36} = 0
c_{41} = 0	c_{42} = 0	c_{43} = 0	c_{44} = 0.23	c_{45} = 0	c_{46} = 0
c_{51} = 0	c_{52} = 0	c_{53} = 0	c_{54} = 0	c_{55} = 0.23	c_{56} = 0
c_{61} = 0	c_{62} = 0	c_{63} = 0	c_{64} = 0	c_{65} = 0	c_{66} = 0.23

$\rho = 7.50 \times 10^3$

Elastic Constants (in 10^{11} N/m^2)

Material: PbS

Crystal Group: Cubic

References: (Elcombe, 67)

$c^E_{11} = 2.03$	$c_{12} = 0.573$	$c_{13} = 0.752$	$c_{14} = 0.085$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = -2.43$	$e_{31} = 0.23$
$c_{21} = 0.573$	$c_{22} = 2.03$	$c_{23} = 0.752$	$c_{24} = -0.085$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 2.43$	$e_{32} = 0.23$
$c_{31} = 0.752$	$c_{32} = 0.752$	$c_{33} = 2.424$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 1.33$
$c_{41} = 0.085$	$c_{42} = -0.085$	$c_{43} = 0$	$c_{44} = 0.595$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 3.76$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.595$	$c_{56} = 0.085$	$e_{15} = 3.76$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0.085$	$c_{66} = 0.7285$	$e_{16} = -2.43$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 3.76$	$e_{16} = -2.43$	$\epsilon^S_{11} = 39.2$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = -2.43$	$e_{22} = 2.43$	$e_{23} = 0$	$e_{24} = 3.76$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 39.2$	$\epsilon_{23} = 0$
$e_{31} = 0.23$	$e_{32} = 0.23$	$e_{33} = 1.33$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 24.7$

$\rho = 4.64 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: $LiNbO_3$
Crystal Group: 3m
Reference: (Smith & Welsh, 71)

$c_{11}^{E} = 2.03$	$c_{12} = 0.53$	$c_{13} = 0.75$	$c_{14} = 0.09$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = -2.5$	$e_{31} = 0.2$
$c_{21} = 0.53$	$c_{22} = 2.03$	$c_{23} = 0.75$	$c_{24} = -0.09$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 2.5$	$e_{32} = 0.2$
$c_{31} = 0.75$	$c_{32} = 0.75$	$c_{33} = 2.45$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 1.3$
$c_{41} = 0.09$	$c_{42} = -0.09$	$c_{43} = 0$	$c_{44} = 0.60$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 3.7$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.60$	$c_{56} = 0.09$	$e_{15} = 3.7$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0.09$	$c_{66} = 0.75$	$e_{16} = -2.5$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 3.7$	$e_{16} = -2.5$	$\epsilon_{11}^{S} = 38.9$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = -2.5$	$e_{22} = 2.5$	$e_{23} = 0$	$e_{24} = 3.7$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 38.9$	$\epsilon_{23} = 0$
$e_{31} = 0.2$	$e_{32} = 0.2$	$e_{33} = 1.3$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 25.7$

$\rho = 4.7 \times 10^3\ kg/m^3$

Elastic (in $10^{11}\ N/m^2$), Dielectric (in $10^{-11}\ F/m$), and Piezoelectric (in C/m^2) Matrices

Material: $LiNbO_3$

Crystal Group: 3m

References: (Warner et al, 67)

$c^E_{11} = 2.02$	$c_{12} = 0.557$	$c_{13} = 0.690$	$c_{14} = 0.0748$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = -2.52$	$e_{31} = 0.75$
$c_{21} = 0.557$	$c_{22} = 2.02$	$c_{23} = 0.690$	$c_{24} = -0.0748$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 2.52$	$e_{32} = 0.75$
$c_{31} = 0.690$	$c_{32} = 0.690$	$c_{33} = 2.40$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 1.67$
$c_{41} = 0.0748$	$c_{42} = -0.0748$	$c_{43} = 0$	$c_{44} = 0.607$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 3.60$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.607$	$c_{56} = 0.0748$	$e_{15} = 3.60$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0.0748$	$c_{66} = 0.729$	$e_{16} = -2.52$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 3.60$	$e_{16} = -2.52$	$\epsilon^S_{11} = 39.8$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = -2.52$	$e_{22} = 2.52$	$e_{23} = 0$	$e_{24} = 3.60$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 39.8$	$\epsilon_{23} = 0$
$e_{31} = 0.75$	$e_{32} = 0.75$	$e_{33} = 1.67$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 24.3$

$\rho = 4.7 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: $LiNbO_3$
Crystal Group: 3m
Reference: (Korolyuk, Matsakov & Vasil'chenko, 71)

$c^E_{11} = 2.298$	$c_{12} = 0.44$	$c_{13} = 0.812$	$c_{14} = -0.104$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = -1.67$	$e_{31} = -0.38$
$c_{21} = 0.44$	$c_{22} = 2.298$	$c_{23} = 0.812$	$c_{24} = 0.104$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 1.67$	$e_{32} = -0.38$
$c_{31} = 0.812$	$c_{32} = 0.812$	$c_{33} = 2.798$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 1.09$
$c_{41} = -0.104$	$c_{42} = 0.104$	$c_{43} = 0$	$c_{44} = 0.968$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 2.72$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.968$	$c_{56} = -0.104$	$e_{15} = 2.72$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = -0.104$	$c_{66} = 0.929$	$e_{16} = -1.67$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 2.72$	$e_{16} = -1.67$	$\epsilon^S_{11} = 37.7$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = -1.67$	$e_{22} = 1.67$	$e_{23} = 0$	$e_{24} = 2.72$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 37.7$	$\epsilon_{23} = 0$
$e_{31} = -0.38$	$e_{32} = -0.38$	$e_{33} = 1.09$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 37.9$

$\rho = 7.454 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: $LiTaO_3$

Crystal Group: 3m

Reference: (Smith & Welsh, 71)

$c^E_{11} = 2.33$	$c_{12} = 0.47$	$c_{13} = 0.80$	$c_{14} = -0.11$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = -1.6$	$e_{31} = 0$
$c_{21} = 0.47$	$c_{22} = 2.33$	$c_{23} = 0.80$	$c_{24} = 0.11$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 1.6$	$e_{32} = 0$
$c_{31} = 0.80$	$c_{32} = 0.80$	$c_{33} = 2.75$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 1.9$
$c_{41} = -0.11$	$c_{42} = 0.11$	$c_{43} = 0$	$c_{44} = 0.94$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 2.6$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.94$	$c_{56} = -0.11$	$e_{15} = 2.6$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = -0.11$	$c_{66} = 0.93$	$e_{16} = -1.6$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 2.6$	$e_{16} = -1.6$	$\epsilon^S_{11} = 36.3$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = -1.6$	$e_{22} = 1.6$	$e_{23} = 0$	$e_{24} = 2.6$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 36.3$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 1.9$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 38.1$

$\rho = 7.45 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: $LiTaO_3$

Crystal Group: 3m

References: (Warner et al, 67)

c_{11} = 2.964	c_{12} = 0.95	c_{13} = 0.95	c_{14} = 0	c_{15} = 0	c_{16} = 0
c_{21} = 0.95	c_{22} = 2.964	c_{23} = 0.95	c_{24} = 0	c_{25} = 0	c_{26} = 0
c_{31} = 0.95	c_{32} = 0.95	c_{33} = 2.964	c_{34} = 0	c_{35} = 0	c_{36} = 0
c_{41} = 0	c_{42} = 0	c_{43} = 0	c_{44} = 1.56	c_{45} = 0	c_{46} = 0
c_{51} = 0	c_{52} = 0	c_{53} = 0	c_{54} = 0	c_{55} = 1.56	c_{56} = 0
c_{61} = 0	c_{62} = 0	c_{63} = 0	c_{64} = 0	c_{65} = 0	c_{66} = 1.56

$\rho = 3583 \times 10^3$

Elastic Constants (in 10^{11} N/m^2)

Material: MgO

Crystal Group: m3m

References: (Anderson & Andreatch, 66)

$c_{11} = 3.115$	$c_{12} = 1.257$	$c_{13} = 1.257$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$
$c_{21} = 1.257$	$c_{22} = 3.115$	$c_{23} = 1.257$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$
$c_{31} = 1.257$	$c_{32} = 1.257$	$c_{33} = 3.115$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.929$	$c_{45} = 0$	$c_{46} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.929$	$c_{56} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.929$

$\rho = 8.9 \times 10^3$ kg/m^3

Elastic Constants (in 10^{11} N/m^2)

Material: Nickel

Crystal Group: Isotropic

References: (Anderson, 65)

c^E_{11} = 0.867	c_{12} = 0.07	c_{13} = 0.119	c_{14} = - 0.179	c_{15} = 0	c_{16} = 0	e_{11} = 0.171	e_{21} = 0	e_{31} = 0
c_{21} = 0.07	c_{22} = 0.867	c_{23} = 0.119	c_{24} = 0.179	c_{25} = 0	c_{26} = 0	e_{12} = - 0.171	e_{22} = 0	e_{32} = 0
c_{31} = 0.119	c_{32} = 0.119	c_{33} = 1.07	c_{34} = 0	c_{35} = 0	c_{36} = 0	e_{13} = 0	e_{23} = 0	e_{33} = 0
c_{41} = - 0.179	c_{42} = 0.179	c_{43} = 0	c_{44} = 0.579	c_{45} = 0	c_{46} = 0	e_{14} = - 0.0406	e_{24} = 0	e_{34} = 0
c_{51} = 0	c_{52} = 0	c_{53} = 0	c_{54} = 0	c_{55} = 0.579	c_{56} = - 0.179	e_{15} = 0	e_{25} = 0.0406	e_{35} = 0
c_{61} = 0	c_{62} = 0	c_{63} = 0	c_{64} = 0	c_{65} = - 0.179	c_{66} = 0.3985	e_{16} = 0	e_{26} = - 0.171	e_{36} = 0
e_{11} = 0.171	e_{12} = - 0.171	e_{13} = 0	e_{14} = - 0.0406	e_{15} = 0	e_{16} = 0	ϵ^S_{11} = 3.92	ϵ_{12} = 0	ϵ_{13} = 0
e_{21} = 0	e_{22} = 0	e_{23} = 0	e_{24} = 0	e_{25} = 0.0406	e_{26} = - 0.171	ϵ_{21} = 0	ϵ_{22} = 3.92	ϵ_{23} = 0
e_{31} = 0	e_{32} = 0	e_{33} = 0	e_{34} = 0	e_{35} = 0	e_{36} = 0	ϵ_{31} = 0	ϵ_{32} = 0	ϵ_{33} = 4.1

$\rho = 2.65 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: Quartz

Crystal Group: 32

References: (Bechmann, 58) (Bechmann et al, 62)

$c^E_{11} = 2.66$	$c_{12} = .73$	$c_{13} = 1.36$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 1.73$	$c_{22} = 2.66$	$c_{23} = 1.36$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 1.36$	$c_{32} = 1.36$	$c_{33} = 4.7$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 1.24$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 1.24$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 1.89$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 76.1$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 76.1$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 150.4$

$\rho = 4.28 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: Rutile

Crystal Group: 4/m 2/m 2/m

References: (National Lead, 67; Traylor et al, 71)

$c^E_{11} = 4.97$	$c_{12} = 1.64$	$c_{13} = 1.11$	$c_{14} = -0.235$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 1.64$	$c_{22} = 4.97$	$c_{23} = 1.11$	$c_{24} = 0.235$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 1.11$	$c_{32} = 1.11$	$c_{33} = 4.98$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = -0.235$	$c_{42} = 0.235$	$c_{43} = 0$	$c_{44} = 1.47$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 1.47$	$c_{56} = -0.235$	$e_{15} = 0$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = -0.235$	$c_{66} = 1.665$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 8.28$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 8.28$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 10.2$

$\rho = 3.98 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: Sapphire (Al_2O_3)

.Crystal Group: $\bar{3}$ m

References: (Wachtman et al, 60 ; McFarlane)

$c^E_{11} = 1.66$	$c_{12} = 0.639$	$c_{13} = 0.639$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 0.639$	$c_{22} = 1.66$	$c_{23} = 0.639$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 0.639$	$c_{32} = 0.639$	$c_{33} = 1.66$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.796$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.796$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.796$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 10.62$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 10.62$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 10.62$

$\rho = 2.33 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: Silicon

Crystal Group: m3m

References: (McSkimin, 53 ; Conwell, 52)

$c_{11} = 1.527$	$c_{12} = 0.869$	$c_{13} = 0.869$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$
$c_{21} = 0.869$	$c_{22} = 1.527$	$c_{23} = 0.869$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$
$c_{31} = 0.869$	$c_{32} = 0.869$	$c_{33} = 1.527$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.329$	$c_{45} = 0$	$c_{46} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.329$	$c_{56} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.329$

$\rho = 10.5 \times 10^3$ kg/m^3

Elastic Constants (in 10^{11} N/m^2)

Material: Silver

Crystal Group: Isotropic

References: (Anderson, 65)

$c^E_{11} = 2.79$	$c_{12} = 1.53$	$c_{13} = 1.53$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 1.53$	$c_{22} = 2.79$	$c_{23} = 1.53$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 1.53$	$c_{32} = 1.53$	$c_{33} = 2.79$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 1.53$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 1.53$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 1.53$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 7.43$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 7.43$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 7.43$

$\rho = 3.581 \times 10^3\ kg/m^3$

Elastic (in $10^{11}\ N/m^2$), Dielectric (in $10^{-11}\ F/m$), and Piezoelectric (in C/m^2) Matrices

Material: Magnesium Aluminate Spinel ($MgO \cdot Al_2O_3$)

Crystal Group: Cubic

References: (Lewis, 66 ; Crystal Technology)

$c_{11}^E = 0.557$	$c_{12} = 0.512$	$c_{13} = 0.218$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 0.512$	$c_{22} = 0.557$	$c_{23} = 0.218$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 0.218$	$c_{32} = 0.218$	$c_{33} = 1.058$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.265$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0.216$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.265$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = -0.216$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.659$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0.216$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon_{11}^S = 20.1$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = -0.216$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 20.1$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 21.9$

$\rho = 5.99 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: TeO_2

Crystal Group: 422

References: (Ohmachi & Uchida, 70)

$c^E_{11} = 3.34$	$c_{12} = 1.11$	$c_{13} = 1.11$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = 0$
$c_{21} = 1.11$	$c_{22} = 3.34$	$c_{23} = 1.11$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = 0$
$c_{31} = 1.11$	$c_{32} = 1.11$	$c_{33} = 3.34$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 1.15$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = 0$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 1.15$	$c_{56} = 0$	$e_{15} = 0$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 1.15$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = 0$	$e_{16} = 0$	$\epsilon^S_{11} = 10.35$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = 0$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 10.35$	$\epsilon_{23} = 0$
$e_{31} = 0$	$e_{32} = 0$	$e_{33} = 0$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 10.35$

$\rho = 4.55 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: YAG

Crystal Group: Cubic

References: (Alton & Barlow, 67; Hurrell et al, 68)

$c_{11} = 2.903$	$c_{12} = 1.173$	$c_{13} = 1.173$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$
$c_{21} = 1.173$	$c_{22} = 2.903$	$c_{23} = 1.173$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$
$c_{31} = 1.173$	$c_{32} = 1.173$	$c_{33} = 2.903$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.955$	$c_{45} = 0$	$c_{46} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.955$	$c_{56} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.955$

$\rho = 5.79 \times 10^3$

Elastic Constants (in 10^{11} N/m^2)

Material: YGaG

Crystal Group: Cubic

References: (Bateman, 66)

c_{11} = 2.69	c_{12} = 1.08	c_{13} = 1.08	c_{14} = 0	c_{15} = 0	c_{16} = 0
c_{21} = 1.08	c_{22} = 2.69	c_{23} = 1.08	c_{24} = 0	c_{25} = 0	c_{26} = 0
c_{31} = 1.08	c_{32} = 1.08	c_{33} = 2.69	c_{34} = 0	c_{35} = 0	c_{36} = 0
c_{41} = 0	c_{42} = 0	c_{43} = 0	c_{44} = 0.764	c_{45} = 0	c_{46} = 0
c_{51} = 0	c_{52} = 0	c_{53} = 0	c_{54} = 0	c_{55} = 0.764	c_{56} = 0
c_{61} = 0	c_{62} = 0	c_{63} = 0	c_{64} = 0	c_{65} = 0	c_{66} = 0.764

$\rho = 5.17 \times 10^3$

Elastic Constants (in 10^{11} N/m^2)

Material: YIG

Crystal Group: Cubic m3m

References: (Clark & Strakna, 61)

$c^E_{11} = 2.09$	$c_{12} = 1.205$	$c_{13} = 1.046$	$c_{14} = 0$	$c_{15} = 0$	$c_{16} = 0$	$e_{11} = 0$	$e_{21} = 0$	$e_{31} = -0.573$
$c_{21} = 1.205$	$c_{22} = 2.096$	$c_{23} = 1.046$	$c_{24} = 0$	$c_{25} = 0$	$c_{26} = 0$	$e_{12} = 0$	$e_{22} = 0$	$e_{32} = -0.573$
$c_{31} = 1.046$	$c_{32} = 1.046$	$c_{33} = 2.106$	$c_{34} = 0$	$c_{35} = 0$	$c_{36} = 0$	$e_{13} = 0$	$e_{23} = 0$	$e_{33} = 1.321$
$c_{41} = 0$	$c_{42} = 0$	$c_{43} = 0$	$c_{44} = 0.423$	$c_{45} = 0$	$c_{46} = 0$	$e_{14} = 0$	$e_{24} = -0.48$	$e_{34} = 0$
$c_{51} = 0$	$c_{52} = 0$	$c_{53} = 0$	$c_{54} = 0$	$c_{55} = 0.423$	$c_{56} = 0$	$e_{15} = -0.48$	$e_{25} = 0$	$e_{35} = 0$
$c_{61} = 0$	$c_{62} = 0$	$c_{63} = 0$	$c_{64} = 0$	$c_{65} = 0$	$c_{66} = 0.4455$	$e_{16} = 0$	$e_{26} = 0$	$e_{36} = 0$
$e_{11} = 0$	$e_{12} = 0$	$e_{13} = 0$	$e_{14} = 0$	$e_{15} = -0.48$	$e_{16} = 0$	$\epsilon^S_{11} = 7.57$	$\epsilon_{12} = 0$	$\epsilon_{13} = 0$
$e_{21} = 0$	$e_{22} = 0$	$e_{23} = 0$	$e_{24} = -0.48$	$e_{25} = 0$	$e_{26} = 0$	$\epsilon_{21} = 0$	$\epsilon_{22} = 7.57$	$\epsilon_{23} = 0$
$e_{31} = -0.573$	$e_{32} = -0.573$	$e_{33} = 1.321$	$e_{34} = 0$	$e_{35} = 0$	$e_{36} = 0$	$\epsilon_{31} = 0$	$\epsilon_{32} = 0$	$\epsilon_{33} = 9.03$

$\rho = 5.665 \times 10^3$ kg/m^3

Elastic (in 10^{11} N/m^2), Dielectric (in 10^{-11} F/m), and Piezoelectric (in C/m^2) Matrices

Material: ZnO

Crystal Group: 6mm

References: (Smith, 69)

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Appendix A

"Rotated Constants" and Euler Angle Notation

The meaning of the "rotated constant" Euler angle notation can best be explained with reference to several examples.

Figure A1 illustrates the standard starting coordinate system in which the propagation axes line up with the crystalline axes X, Y and Z. Thus, one can follow how the standard Euler angle notation 0, 90, θ refers to rotation in the XZ plane, starting with a propagation direction along the X axis and a plate normal along the -Y axis. This is the Y plane illustrated in Figure A2.

If, however, we first rotate through the Euler angles 45, 90, 35.264 then the 1 axis, or propagation direction, is initially aligned with the [111] crystalline axis and the 3 axis or plate normal would lie along the [110] crystalline axis. This is illustrated in Figure A3 which also indicates how further rotations can then be accomplished from this starting point. The notation used in the text to describe this situation is illustrated in Figure A4.

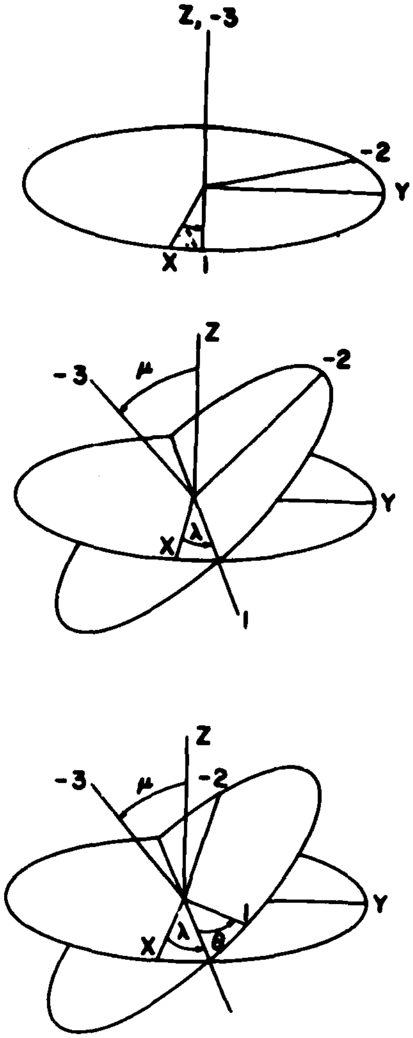

Figure A1. Coordinate System Used to Define Acoustic Wave Propagation. The phase velocity vector lies along the 1 axis. The crystalline axes are given by X, Y, and Z while the Euler angles are λ, μ and θ (After H. Goldstein in Classical Mechanics)

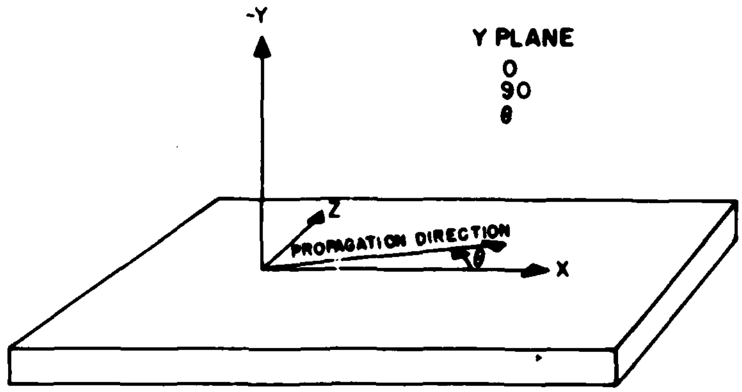

Figure A2. Standard Notation For a Y Plane. Rotation of μ through the angle of 90° aligns the plate normal with the (-Y) crystalline axis while the propagation direction remains along the X axis. Further rotations in the plane of the plate are then accomplished through the angle θ

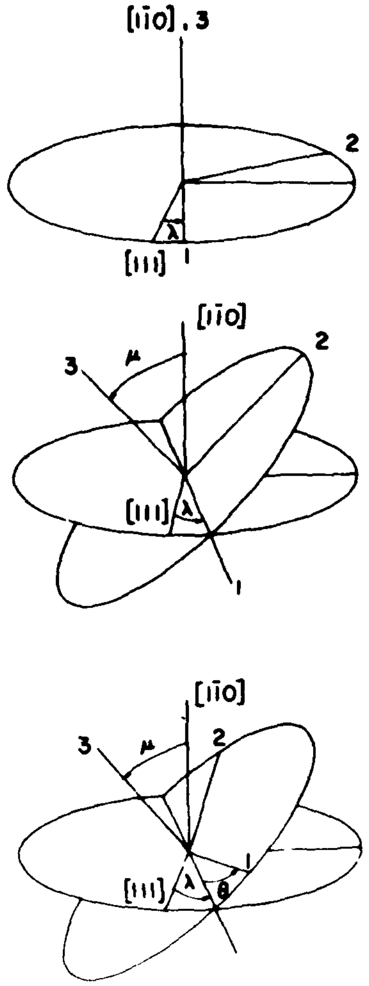

Figure A3. Coordinate System After Initial Rotation Through the Euler Angles 45, 90, 35.264. The phase velocity vector lies along the 1 axis while the plate normal lies along the negative 3 axis. The crystalline axes are given by [111] and [110]. Euler angles for further rotations from this starting points are λ, μ and θ (After H. Goldstein in Classical Mechanics)

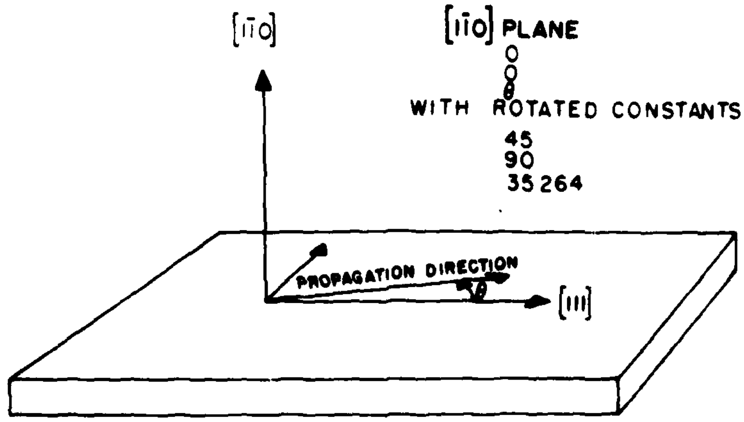

Figure A4. Standard Notation for a [110] Plane. Initial rotation through the Euler angles 45, 90 35.264 aligns the propagation direction with the [111] crystalline axis and the plate normal with the [110] crystalline axis. Further rotations in the plane of the plate are then accomplished through the angle θ

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